

## 3.8 VEGETATION<sup>1</sup>

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### 3.8-1 INTRODUCTION

The proposed Heavenly Mountain Resort Epic Discovery Project is contained within the boundaries of the existing Special Use Permit Area in accordance with the 2003 Forest Service's Lake Tahoe Basin Management Unit (Forest Service) special use permit approval. A delineation of this boundary can be located on Figure 1-1 in Chapter 1, Introduction and Purpose and Need. No expansion or modification of Heavenly's facilities is proposed outside of this Special Use Permit boundary. Impacts to vegetation resources are confined within the boundaries of this area. Much of the following information has been taken from the Draft and Final EIR/EIS/EIS (95 Draft and 96 Final EIR/EIS/EIS) documents prepared for the 1996 Heavenly Mountain Resort Master Plan (MP 96) and the 2007 FEIR/EIS/EIS prepared for the 2007 Master Plan Amendment and updated accordingly.

### 3.8-2 ENVIRONMENTAL AND REGULATORY SETTING

#### Sensitive Plant Species

A number of sensitive plant species have been recorded or have potential habitat within the Lake Tahoe Basin (Table 3.8-1). For the purposes of this document, these sensitive plant species are defined to include:

- Federally listed, proposed, and candidate threatened and endangered species (Federal Register 50 of Federal Regulations Part 17.11 and 17.12);
- Species officially listed as rare, threatened, and endangered by the State of California Endangered Species Act of 1984;
- Plants listed as rare, threatened, or endangered (California Rare Plant Rank) by the California Native Plant Society (2005);
- Species inventoried by the California Natural Diversity Database (CNDDDB), Nongame Heritage Program, California Department of Fish and Wildlife, April 2014;
- Plants listed as Sensitive Plants by the TRPA and for which the TRPA has established environmental thresholds based on a minimum number of population sites (Table 3.8-2).
- Plants listed as Critically Endangered by the Nevada Division of Forestry under Nevada Revised Statutes 527.260-.300.
- U.S. Forest Service LTBMU Sensitive Species, Regional Forester's Sensitive Species List, Amended 2013

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<sup>1</sup> Note: This Chapter 3.8 of the EIR/EIS/EIS has been modified since its circulation as part of the Draft EIR/EIS/EIS. The modifications are not shown in revision mode because of the substantial reorganization of the setting sections and numerous revisions to the analysis that make it consistent with the Forest Service Biological Evaluation. The modifications do not substantially alter the conclusions or list of design features proposed to minimize potential impacts, but provide greater detail and reference to existing habitat conditions and impacts from the proposed project and Alternatives.

**Table 3.8-1**

Sensitive Plant Species Evaluated for Epic Discovery Projects					
	Species	Status*	Habitat Characteristics	Known to occur in project area	Potential habitat in project area
1	<i>Boechea rigidissima</i> ( <i>Arabis rigidissima</i> var. <i>demota</i> ) Galena Creek rockcress	FSS, 1B, TRPA	Open, rocky areas along forest edges of conifer and/or aspen stands; usually found on north aspects; 7,500 ft. & above.	Y	Y
2	<i>Boechea tiehmii</i> Tiehm rockcress	FSS, 1B	Open rocky soils in the Mt. Rose Wilderness; 10,000 ft. & above.	N	N
3	<i>Boechea tularensis</i> Tulare rockcress	FSS, 1B	Shaded, mostly east-facing subalpine rocky areas, including rocky slopes, rock-lined streams and seeps, rocky outcrops, saddles, and canyons; 6,000-11,000 ft.	N	N
	<i>Botrychium</i> spp.	FSS	<i>Botrychium</i> species are found in similar habitat; wet or moist soils such as marshes, meadows, and along the edges of lakes and streams; generally occur with mosses, sedges, rushes, and other riparian vegetation; 2,000-10,000 ft.		
4	<i>Botrychium ascendens</i> Upswept moonwort	FSS, 2	See <i>Botrychium</i> spp.	N	Y
5	<i>Botrychium crenulatum</i> Scalloped moonwort	FSS, 2	See <i>Botrychium</i> spp.	N	Y
6	<i>Botrychium lineare</i> Slender moonwort	C, FSS, 1B	See <i>Botrychium</i> spp.	N	Y
7	<i>Botrychium lunaria</i> Common moonwort	FSS, 2	See <i>Botrychium</i> spp.	N	Y
8	<i>Botrychium minganense</i> Mingan moonwort	FSS, 2	See <i>Botrychium</i> spp.	N	Y
9	<i>Botrychium montanum</i> Mountain moonwort	FSS, 2	See <i>Botrychium</i> spp.	N	Y

**Table 3.8-1**

Sensitive Plant Species Evaluated for Epic Discovery Projects					
	Species	Status*	Habitat Characteristics	Known to occur in project area	Potential habitat in project area
10	<i>Bruchia bolanderi</i> Bolander's candle moss	FSS, 2	Mainly in montane meadows and stream banks, but also on bare, slightly eroding soil where competition is minimal.	N	N
11	<i>Dendrocollybia racemosa</i>	FSS	On old decayed or blackened mushrooms or occasionally in coniferous duff, usually within old growth stands.	N	Y
12	<i>Draba asterophora</i> var. <i>asterophora</i> Tahoe draba	FSS, TRPA, 1B	Rock crevices and open granite talus slopes on north-east slopes; 8,000-10,200 ft.	Y	Y
13	<i>Draba asterophora</i> var. <i>macrocarpa</i> Cup Lake draba	FSS, TRPA, 1B	Steep, gravelly or rocky slopes; 8,400-9,300 ft.	N	Y
14	<i>Draba cruciata</i> Mineral King draba	1B	Subalpine gravelly or rocky slopes, ridges, crevices, cliff ledges, sink holes, boulder and small drainage edges; 7,800-13,000 ft.	N	Y
15	<i>Erigeron miser</i>	FSS, 1B	Granitic rock outcrops; 6,000 ft. & above	N	Y
16	<i>Eriogonum luteolum</i> var. <i>saltuarium</i> Goldencarpet buckwheat	FSS	Sandy granitic flats and slopes, sagebrush communities, montane conifer woodlands; 5,600-7,400 ft.	N	N
17	<i>Eriogonum umbellatum</i> var. <i>torreyanum</i> Donner Pass buckwheat	FSS, 1B	Dry gravelly or stony sites; often on harsh exposures (e.g. ridge tops, steep slopes)	N	Y
18	<i>Helodium blandowii</i> Blandow's feather moss	FSS	Bogs, fens, wet meadows, and along streams under willows.	N	Y
19	<i>Hulsea brevifolia</i> Short leaved hulsea	FSS, 1B	Red fir forest, but also in mixed conifer forests; found on gravelly soils; 4,900-8,900 ft.	N	Y
20	<i>Ivesia sericoleuca</i> Plumas ivesia	FSS	Associated with seasonally wet meadows, meadow ecotones, terraces and toeslopes on soils which are primarily volcanic in origin. The plant has not been located on granitic soils.	N	N
21	<i>Lewisia kelloggii</i> spp. <i>hutchinsonii</i> Hutchison's lewisia	FSS	Ridge tops or flat open spaces with widely spaced trees and sandy granitic to erosive volcanic soil; 5,000-7,000 ft.	N	Y

**Table 3.8-1**

Sensitive Plant Species Evaluated for Epic Discovery Projects					
	Species	Status*	Habitat Characteristics	Known to occur in project area	Potential habitat in project area
22	<i>Lewisia kelloggii</i> <i>ssp. kelloggii</i> Kellogg's lewisia	FSS	Ridge tops or flat open spaces with widely spaced trees and sandy granitic to erosive volcanic soil; 5,000-7,000 ft.	N	Y
23	<i>Lewisia longipetala</i> long-petaled lewisia	FSS, TRPA, 1B	North-facing slopes and ridge tops where snow banks persist throughout the summer; often found near snow bank margins in wet soils; 8,000-12,500 ft.	N	N
	<i>Meesia uliginosa</i> broad-nerved hump-moss	FSS, 2	Bogs and fens, but also very wet meadows.	N	N
25	<i>Orthotrichum praemorsum</i> Orthotrichum moss	FSS	Shaded, moist habitats of east side of Sierra Nevada rock outcrops; up to 8,200 ft.	N	N
26	<i>Peltigera gowardii</i> Goward's veined lichen	FSS	Cold unpolluted streams in mixed conifer forests.	N	Y
27	<i>Pinus albicaulis</i> Whitebark pine	C, FSS	Subalpine and at timberline on rocky, well-drained granitic or volcanic soils.	Y	Y
28	<i>Rorippa subumbellata</i> Tahoe yellowcress	C, FSS, TRPA, SE, 1B	Subalpine and at timberline on rocky, well-drained granitic or volcanic soils.	N	N

Source: USDA Forest Service, List of Sensitive Species of the LTBMU; Tahoe Regional Planning Agency, Environmental Thresholds, CNDDDB, May 2014;

\* Status Codes:

Above List revised 2014

No species in LTBMU are currently listed as threatened or endangered by the U.S. Fish and Wildlife Service under ESA.

CRPR 1B, 2, 3 = Plants listed as rare, threatened or endangered in California and elsewhere by the California Native Plant Society. All of the plants on this list meet the definitions of Section 1901, Chapter 10 (Native Plant Protection) of the California Department of Fish and Game Code and are eligible for state listing.

C = USFWS Candidate species for listing as threatened or endangered under ESA

FSS = U.S. Forest Service LTBMU Sensitive Species, Regional Forester's Sensitive Species List, Amended 2013

TRPA = TRPA Sensitive Species, Regional Plan for The LTBMU: Goals and Policies (1986) and Code of Ordinances (1987)

SE = State Endangered in California and/or Nevada

## Federal Law

**Endangered Species Act (16 USC 1531 et seq.):** This EIR/EIS/EIS is being prepared in accordance with the Endangered Species Act of 1973 as amended (16 USC 1531 et seq.). Under this act, federal agencies must ensure that any action authorized, funded, or carried out by the

agency is not likely to (a) jeopardize the continued existence of any listed species or (b) result in the destruction or adverse modification of a listed species' designated critical habitat. Section 7 of the act requires federal agencies to consult the U.S. Fish and Wildlife Service concerning listed (i.e. threatened or endangered) plant species that fall under their jurisdiction.

### **Forest Service Direction**

**Forest Service Manual, Section 2670 (USDA 2005):** provides policy for the protection of sensitive species and calls for the development and implementation of management practices to ensure that species do not become threatened or endangered because of Forest Service actions. It requires a review of all activities or programs that are planned, funded, executed, or permitted for possible effects on federally listed or Forest Service sensitive species (FSM 2672.4, USDA 2005).

A Biological Evaluation (BE) provides the means to conduct this review, analyze the significance of potential adverse effects, and determine how negative impacts will be minimized or avoided for those species whose viability has been identified as a concern. The objectives of a BE are to:

- ensure that Forest Service actions do not contribute to loss of viability of any native or desired nonnative plant or animal species;
- ensure that Forest Service actions do not jeopardize or adversely modify critical habitat of Federally listed species; and
- provide a process and standard through which rare plant species receive full consideration throughout the planning process, reducing negative impacts on species and enhancing opportunities for mitigation.

A Biological Evaluation of Botanical Species has been prepared in conjunction with this EIR/EIS/EIS for the affected NFS lands.

### **Forest Service Regional and Forest Plan Direction**

**Sierra Nevada Forest Plan Amendment (SNFPA) Record of Decision (USDA 2004):** establishes standards and guidelines pertaining to the protection and consideration of sensitive plants, including conducting field surveys, minimizing or eliminating direct and indirect impacts from management activities, and adhering to the Regional Native Plant Policy (USDA 1994).

**LTBMU Land Resource Management Plan (LRMP) (USDA 1988):** directs the LTBMU to manage the viability of sensitive botanical species and to ensure that these species do not become threatened or endangered because of Forest Service activities. The primary purpose of the direction is to assure that existing habitat of these species is adequately protected and that additional habitat is provided to perpetuate the species. This direction implements the protections legislated in the National Forest Management Act and the Endangered Species Act.

Detailed species accounts which describe the known range, habitat requirements, and local occurrence data for each sensitive plant species known to occur or potentially occur in the Heavenly Mountain Resort Epic Discovery project area are included in the Epic Discovery Projects Biological Evaluation on file at the Lake Tahoe Basin Management Unit.

The project area occurs in the management area designated as Heavenly Valley Management Area. In the LRMP, the primary use of this area has been designated as alpine skiing and maintenance.

### **3.8-3 EVALUATION CRITERIA**

An environmental impact is defined as a change in the existing environmental conditions. For the purpose of this document, an impact is considered significant if it does not comply with the Goals, Policies, and Ordinances of the TRPA Regional Plan, exceeds TRPA Environmental Thresholds, or meets the criteria for a significant effect as defined by the State CEQA Guidelines or the National Environmental Policy Act. The applicable TRPA, CEQA, and NEPA significance criteria are provided below.

#### **Tahoe Regional Planning Agency**

##### ***TRPA Environmental Thresholds***

The TRPA has established environmental thresholds for common vegetation (including richness, relative abundance, and pattern), uncommon plant communities, and sensitive plants. These environmental thresholds are used to establish the significance of an environmental effect to vegetation resources in the Lake Tahoe Basin. TRPA environmental thresholds for vegetation resources are defined below.

##### *Common Vegetation*

Increase plant and structural diversity of forest communities through appropriate management practices as measured by diversity indices of species richness, relative abundance, and pattern.

##### *Richness*

Maintain the existing species richness of the basin by providing for the perpetuation of the following plant associations:

*Yellow Pine Forest:* Jeffrey pine, white fir, incense cedar, sugar pine.

*Red Fir Forest:* red fir, Jeffrey pine, lodgepole pine, western white pine, mountain hemlock, western juniper.

*Subalpine Forest:* whitebark pine, mountain hemlock, mountain mahogany.

*Shrub Associations:* greenleaf and pinemat manzanita, tobacco brush, Sierra chinquapin, huckleberry oak, mountain whitethorn.

*Sagebrush Scrub Vegetation:* basin sagebrush, bitterbrush, Douglas chamise.

*Deciduous Riparian:* quaking aspen, mountain alder, black cottonwood, willow.

*Meadow Association (wet and dry meadow):* mountain squirrel tail, alpine gentian, whorled penstemon, asters, fescues, mountain brome, corn lilies, mountain bentgrass, hairgrass, marsh marigold, elephant heads, tinker's penney, mountain Timothy, sedges, rushes, buttercups.

*Wetland Associations (marsh vegetation):* Pond lilies, buckbean, mare's tail, pondweed, common bladderwort, bottle sedge, common spikerush.

*Cushion Plant Association (alpine scrub):* Alpine phlox, dwarf ragwort, Draba.

### *Relative Abundance*

Of the total amount of undisturbed vegetation in the Lake Tahoe Basin:

- Maintain at least 4 percent meadow and wetland vegetation.
- Maintain at least 4 percent deciduous riparian vegetation.
- Maintain no more than 25 percent dominant shrub association vegetation.
- Maintain 15-25 percent of the Yellow Pine Forest in seral stages other than mature.
- Maintain 15-25 percent of the Red Fir Forest in seral stages other than mature.

### *Pattern*

Provide for the proper juxtaposition of vegetation communities and age classes by:

- Limiting acreage size of new forest openings to no more than eight acres.
- Adjacent openings shall not be of the same relative age class or successional stage to avoid uniformity in stand composition and age.

A non-degradation standard to preserve plant communities shall apply to native deciduous trees, wetlands, and meadows while providing for opportunities to increase the acreage of such riparian associations to be consistent with the SEZ threshold.

Native vegetation shall be maintained at a maximum level to be consistent with the limits defined in the Land Capability Classification of the Lake Tahoe Basin, California-Nevada, A Guide for Planning, Bailey, 1974, for allowable impervious cover and permanent site disturbance.

### *Uncommon Plant Communities*

Provide for the non-degradation of the natural qualities of any plant community uncommon to the Tahoe Basin or of exceptional scientific, ecological, or scenic value.

This threshold shall apply but not be limited to:

1. The deepwater plants of Lake Tahoe;
2. Grass Lake (sphagnum bog);
3. Osgood swamp; and
4. the Freel Peak Cushion Plant community.

#### *Sensitive Plants*

Maintain a minimum number of population sites for each of the sensitive plant species identified in Table 3.8-2.

**Table 3.8-2**

#### TRPA Sensitive Plants

Species	Number of Population Sites
<i>Draba asterophora</i> var. <i>asterophora</i>	5
<i>Draba asterophora</i> var. <i>macrocarpa</i>	2
<i>Boechera rigidissima</i> var. <i>demote</i> ( <i>Arabis rigidissima</i> var. <i>demote</i> )	2
<i>Lewisia longipetala</i>	2
<i>Rorippa subumbellata</i>	26

Source: TRPA

#### **TRPA Goals and Policies - Conservation Element - Vegetation**

GOAL VEG-1: PROVIDE FOR A WIDE MIX AND INCREASED DIVERSITY OF PLANT COMMUNITIES IN THE TAHOE REGION.

The natural succession of vegetation in the Region has been stifled over the past 130 years. Following clear cut activities in the late 1800s, the forest vegetation has been managed under wildfire exclusion policies. The resulting lack of naturally occurring fires and other natural perturbations has created an unnatural forest structure with regard to forest health and diversity. Extensive and overstocked stands of second growth conifers now dominate the forest vegetation. Other plant communities that require openings in the forest canopy are relatively scarce. The resulting situation is one of low plant diversity, poor age class structure, vulnerability to disease and pest organisms and increased risk of catastrophic wildfire. The preservation of the Region's vegetation and the achievement of environmental thresholds require programs that preserve or protect certain plant communities and species while permitting increased opportunities to manage the vegetation for diversity, fire prevention, and health. Attainment of these thresholds requires an on-going program involving harvest of fire fuels, revegetation, and vegetation manipulation.

POLICIES:

1. VEG-1.1 FOREST MANAGEMENT PRACTICES SHALL BE ALLOWED WHEN CONSISTENT WITH ACCEPTABLE STRATEGIES FOR THE MAINTENANCE AND ENHANCEMENT OF FOREST HEALTH AND DIVERSITY, PREVENTION OF WILDFIRE, PROTECTION OF WATER QUALITY, AND ENHANCEMENT OF WILDLIFE HABITATS.

Forest management practices that may include both timber harvest and pre-scribed burning are acceptable strategies for restoring and maintaining the biological health of the forest ecosystem. This policy would also permit practices necessary to reduce the risk of catastrophic wildfires.

2. VEG-1.2 OPPORTUNITIES TO IMPROVE THE AGE STRUCTURE OF THE PINE AND FIR PLANT COMMUNITIES SHALL BE ENCOURAGED WHEN CONSISTENT WITH OTHER ENVIRONMENTAL CONSIDERATIONS.

The conifer forests of the Tahoe Region are mostly even-aged. This has serious implications related to plant diversity and forest health. Opportunities to increase the ratio of young trees to mature trees should be encouraged.

3. VEG-1.3 FOREST PATTERN SHALL BE MANIPULATED WHENEVER APPROPRIATE AS GUIDED BY THE SIZE AND DISTRIBUTION OF FOREST OPENINGS.

Extensive stands of even-aged timber predominate in the Tahoe Region. Openings in these stands are uncommon. The forest pattern and resultant plant diversity can be improved through forest management practices that open-up the forest canopy to increase the proportion of shrub and meadow communities.

4. VEG-1.4 EDGE ZONES BETWEEN ADJACENT PLANT COMMUNITIES SHALL BE MAXIMIZED AND TREATED FOR THEIR SPECIAL VALUE RELATIVE TO PLANT DIVERSITY AND WILDLIFE HABITAT.

The mixing of two plant communities creates a zone of high plant diversity and provides an effective screen between adjacent land uses. Besides the benefit of increased plant diversity, edge zones provide critical habitats to many species of wildlife.

5. VEG-1.5 PERMANENT DISTURBANCE OR UNNECESSARY ALTERATION OF NATURAL VEGETATION ASSOCIATED WITH DEVELOPMENT ACTIVITIES SHALL NOT EXCEED THE APPROVED BOUNDARIES (OR FOOTPRINTS) OF THE BUILDING, DRIVEWAY, OR PARKING STRUCTURES, OR THAT WHICH IS NECESSARY TO REDUCE THE RISK OF FIRE OR EROSION.

Protecting the existing vegetation around a construction site will aid in preventing soil compaction or disturbance due to equipment and human trampling. It will also reduce the need for revegetation and landscaping.

6. VEG-1.6 THE MANAGEMENT OF VEGETATION IN URBAN AREAS SHALL BE IN ACCORDANCE WITH THE POLICIES OF THIS PLAN AND SHALL INCLUDE PROVISIONS THAT ALLOW FOR THE PERPETUATION OF THE NATURAL-APPEARING LANDSCAPE.

The beauty of the Tahoe Region depends, in part, on the successful "blending" of the natural environment with the built environment. Vegetation in urban areas shall be preserved to the maximum extent feasible so as to avoid sharp contrasts between the urban and non-urban portions of the Region. Conditions of project approval for all grading, harvesting, landscaping, and other project proposals shall be required, as necessary, to implement the intent of this policy.

7. VEG-1.7 MAINTAIN FOREST LITTER FOR ITS EROSION CONTROL AND NUTRIENT CYCLING FUNCTIONS IN NATURALLY-VEGETATED AREAS EXCEPT TO THE EXTENT IT POSES A FIRE HAZARD.

The fungi associated with decaying plant material act as nutrient "sinks" by picking up plant nutrients that would otherwise be lost to adjacent water bodies during spring runoff.

8. VEG-1.8 PROMOTE USE OF NATIVE, WATER-EFFICIENT, NUTRIENT-EFFICIENT, FIRE- RESISTANT AND NON-INVASIVE VEGETATION IN URBAN AREAS AND DURING REVEGETATION OF DISTURBED SITES.

Native plants are adapted to the special altitude, climate, and soil characteristics of the Region. Use of non-native species often requires constant care and artificial amounts of water and fertilizer. Revegetation of disturbed sites will require the use of native plants whenever practical, but other approved species also may be appropriate.

9. VEG-1.9 ALL PROPOSED ACTIONS SHALL CONSIDER THE CUMULATIVE IMPACT OF VEGETATION REMOVAL WITH RESPECT TO PLANT DIVERSITY AND ABUNDANCE, WILDLIFE HABITAT AND MOVEMENT, SOIL PRODUCTIVITY AND STABILITY, AND WATER QUALITY AND QUANTITY.

The piecemeal and incremental removal of vegetation may have significant cumulative impacts on the natural resource values of the Region. Project review should consider both the direct and indirect impacts of all development, as well as fire safety.

10. VEG-1.10 WORK TO ERADICATE AND PREVENT THE SPREAD OF INVASIVE SPECIES.
11. VEG-1.11 ENCOURAGE LOCAL GOVERNMENTS TO DEVELOP URBAN FORESTRY COMPONENTS WITHIN THEIR AREA PLANS. URBAN FORESTRY PROGRAMS SHOULD SEEK TO REESTABLISH NATURAL FOREST CONDITIONS IN A MANNER THAT DOES NOT INCREASE THE RISK OF CATASTROPHIC WILDFIRE.

## GOAL VEG-2: PROVIDE FOR THE PROTECTION, MAINTENANCE AND RESTORATION OF SUCH UNIQUE ECO-SYSTEMS AS WETLANDS, MEADOWS, AND OTHER RIPARIAN VEGETATION.

Riparian vegetation is a critical component of the Tahoe Region's natural vegetation. These communities serve a variety of useful functions especially related to water quality and quantity. Riparian plant communities also significantly contribute to plant and animal diversity, recreation, and scenic quality. Strategies to protect these qualities are developed within the framework of adopted environmental thresholds for soils, vegetation, and wildlife.

**POLICIES:**

1. VEG-2.1 RIPARIAN PLANT COMMUNITIES SHALL BE MANAGED FOR THE BENEFICIAL USES OF PASSIVE RECREATION, GROUNDWATER RECHARGE, AND NUTRIENT CATCHMENT, AND AS WILDLIFE HABITATS.

The preservation of riparian zones in their natural states should be emphasized over more intensive uses. These plant communities serve a variety of natural functions that benefit the scenic, wildlife, and water resources of the Tahoe Region.

2. VEG-2.2 RIPARIAN PLANT COMMUNITIES SHALL BE RESTORED OR EXPANDED WHENEVER AND WHEREVER POSSIBLE. WHEN COMPLETE RESTORATION IS NOT FEASIBLE, RESTORATION PROGRAMS SHALL FOCUS ON RESTORING THE NATURAL FUNCTION OF RIPARIAN AREAS TO THE GREATEST EXTENT PRACTICAL.

Riparian plant communities are the single most important habitat for wildlife in the Region and provide the most cost-effective means of water cleansing. Existing functioning riparian plant communities shall be maintained in their natural conditions to promote such beneficial functions. The schedule for restoration, as required by the thresholds, will correspond to the schedule for restoring Stream Environment Zones outlined in the Environmental Improvement Program.

**GOAL VEG-3: CONSERVE THREATENED, ENDANGERED, AND SENSITIVE PLANT SPECIES AND UNCOMMON PLANT COMMUNITIES OF THE LAKE TAHOE REGION.**

A few examples of rare plants and uncommon plant communities can be found in the Lake Tahoe Region. These resources are a real part of the Region's natural endowment and need to be protected from indiscriminant loss or destruction. Otherwise, the danger of extinction can become a reality. Direction for preservation is provided by adopted environmental thresholds.

**POLICIES:**

1. VEG-3.1 UNCOMMON PLANT COMMUNITIES SHALL BE IDENTIFIED AND PROTECTED FOR THEIR NATURAL VALUES.

Rare examples of Lake Tahoe's natural vegetation should be preserved for their ecological and local significance. Indiscriminate loss of uncommon plant communities shall be avoided. This policy applies specifically to those plant communities for which thresholds were adopted, but also may be extended to other communities later identified as significant by TRPA in cooperation with resource agencies. Attainment of the vegetation thresholds and implementation of this policy require close cooperation between this Agency and other agencies responsible for the protection and management of the Region's natural resources.

2. VEG-3.2 THE POPULATION SITES AND CRITICAL HABITAT OF ALL SENSITIVE PLANT SPECIES IN THE LAKE TAHOE REGION SHALL BE IDENTIFIED AND PRESERVED.

The Tahoe Region provides a favorable habitat for a few species of exceptionally scarce plants. Without proper protection, these sensitive plants may become extinct. Monitoring and evaluation programs will be necessary, in cooperation with the U.S. Forest Service and other interested agencies and individuals, to implement this policy.

3. VEG-3.3 THE CONSERVATION STRATEGY FOR TAHOE YELLOW CRESS IN THE LAKE TAHOE REGION SHALL FOSTER STEWARDSHIP FOR THIS SPECIES BY:
  1. Providing education to landowners;
  2. Providing technical and planning assistance to landowners with Tahoe Yellow Cress to develop stewardship plans;
  3. Streamlining the Tahoe Yellow Cress project review process, while protecting the species and its habitat; and
  4. Support propagation efforts.

### ***TRPA Late Seral/Old Growth Threshold***

This threshold requires that 7,600 acres in the subalpine zone, 45,900 acres in the upper montane zone, and 30,600 acres in the montane zone shall be in a late seral/old growth condition.

The thresholds for late seral/ old growth ecosystems are as follows:

Attain and maintain a minimum percentage of 55 percent by area of forested lands within the Tahoe Region in a late seral or old growth condition, and distributed across elevation zones. To achieve the 55 percent, the elevation zones shall contribute as follows:

- The Subalpine zone (greater than 8,500 feet elevation) will contribute 5 percent (7,600 acres) of the forested lands;
- The Upper Montane zone (between 7,000 and 8,500 feet elevation) will contribute 30 percent (45,900 acres) of forested lands;
- The Montane zone (lower than 7,000 feet elevation) will contribute 20 percent (30,600 acres) of forested lands.

Forested lands within TRPA designated urban areas are excluded in the calculation for threshold attainment. Areas of the montane zone within 1,250 feet of urban areas may be included in the calculation for threshold attainment if the area is actively being managed for late seral and old growth conditions and has been mapped by TRPA. A maximum value of 40 percent of the lands within 1,250 feet of urban areas may be included in the calculation. Because of these restrictions the following percentage of each elevation zone must be attained to achieve this threshold:

- 61 percent of the Subalpine zone must be in a late seral or old growth condition;
- 60 percent of the Upper Montane zone must be in a late seral or old growth condition;

- 48 percent of the Montane zone must be in a late seral or old growth condition.

Goal #4 Provide for and Increase the Amount of Late Seral/Old Growth Stands within the Lake Tahoe Basin.

Late seral/old growth forest stands are rare in the basin, but provide high quality habitat for many wildlife and plant species. In the year 2000, it was estimated that less than 5 percent of the forest stands could be conservatively classified as late seral/old growth. The desired future condition for forested land within the Tahoe Basin is that the forests should reflect the pre-settlement conditions to the degree possible. The best available estimate of the amount of late seral/old growth forest in pre-settlement times is 55 percent of the total forest. With the existing state of the basin's forest dominated by mature, even aged stands, active management is necessary to increase the amount of late seral/old growth forest.

### *POLICIES*

**4.1. STANDS EXHIBITING LATE SERAL/OLD GROWTH CHARACTERISTICS SHALL BE MANAGED TO ALLOW THESE STANDS TO SUSTAIN THESE CONDITIONS.**

The existing forest stands that exhibit late seral/old growth characteristics are rare in the basin and should be protected. These stands act as a refuge for late seral/old growth species and will be critical for future restoration of additional late seral/old growth stands.

**4.2. STANDS NOT EXHIBITING LATE SERAL/OLD GROWTH CHARACTERISTICS SHALL BE MANAGED TO PROGRESS TOWARDS LATE SERAL/OLD GROWTH.**

Forest stands that do not currently exhibit late seral/old growth characteristics, and that can reasonably be expected to produce late seral/old growth characteristics, should be managed to move the stand towards increasing late seral/old growth characteristics. Active management is the primary vehicle for producing the desired future conditions. Management may entail thinning of smaller trees, alteration of the species composition, and other ecosystem manipulations.

**4.3. PRESCRIPTIONS FOR TREATING THESE STANDS WILL BE PREPARED ON A STAND-BY-STAND BASIS. EACH PRESCRIPTION WILL DEMONSTRATE/EXPLAIN HOW IT WILL PROMOTE LATE SERAL OR OLD GROWTH CHARACTERISTICS PRIOR TO APPLYING ANY MECHANICAL TREATMENT OR PRESCRIBED FIRE. STAND-SPECIFIC PRESCRIPTIONS WILL BE DEVELOPED USING THE BEST AVAILABLE FOREST AND ECOSYSTEM MANAGEMENT SCIENCE, STRATEGIES, STANDARDS AND GUIDELINES.**

Late seral/old growth forest management applies best available scientific information to identify valued characteristics of late seral/old growth forests, and to manage for these characteristics. Site capabilities, habitat requirements of old growth-associated wildlife species, forest science including silviculture, and available information on general and site-specific pre-settlement forest structures and patterns provide guidance to site-specific management. The *Sierra Nevada Ecosystem Project Report* (2000), the *Lake Tahoe Watershed Assessment* (December 2000), and the *Sierra Nevada Forest Plan Amendment* (January 2001), apply scientific and forest management literature to identify important late seral/old growth forest characteristics. These documents also provide examples of management strategies, standards and guidelines for promoting these characteristics.

**4.4. RETAIN LARGE TREES AS A PRINCIPAL COMPONENT OF LATE SERAL/OLD GROWTH ECOSYSTEMS.**

Large trees are one of the defining components of late seral/old growth ecosystems. Without large trees present a forest stand cannot be classified as late seral/old growth. Many of the other components of late seral/old growth ecosystems are derived from large trees, including snags, down woody material, and soil conditions. The retention of large trees is a critical management strategy to achieve the late seral/old growth threshold.

**4.5. RETAIN TREES OF MEDIUM AND SMALL SIZE SUFFICIENT TO PROVIDE FOR LARGE TREE RECRUITMENT OVER TIME, AND TO PROVIDE STRUCTURAL DIVERSITY. PREFERABLY, THESE TREES WILL BE THE MOST VIGOROUS IN THE STAND USING ONE OF THE STANDARD TREE CLASSIFICATIONS. IN ADDITION, SPECIES COMPOSITION SHOULD BE KEY CONSIDERATION IN TREE RETENTION.**

The forests of the Lake Tahoe Region are largely even-aged as a result of forest regeneration after logging followed by discovery of the Comstock Lode. The large trees of today have finite life spans, and must eventually be replaced. Additionally, appropriate diversity of small, medium and large trees provides vertical structural diversity for wildlife. Tree species composition is an important characteristic of forests, affecting wildlife uses and forest health. Promoting and perpetuating late seral/old growth forest conditions require the future provision for a desired species composition, now and the future. Prior to settlement, natural events provided a well-adapted species mix. Today, forest planning for future conditions is needed because humans have changed the balance of forces operating in the forest that would produce the desired future condition for the forest.

**4.6. USE OF PRESCRIBED FIRE IS PREFERRED TO REDUCE FIRE HAZARD AND PERPETUATE DESIRED NATURAL ECOLOGICAL PROCESSES. MANUAL AND MECHANICAL TREATMENT MAY BE USED TO REDUCE FOREST FUEL LEVELS AND TO IMPROVE LATE SERAL FOREST CONDITIONS IN ADDITION TO, OR IN LIEU OF, PRESCRIBED FIRE.**

Fire is an effective and efficient tool to reduce forest fuels and thus fire risk. Additionally, fire is a natural ecological process that historically shaped the distribution and structure of vegetation and wildlife communities in the Sierra Nevada and Lake Tahoe basin. Use of prescribed fire or mechanical treatment to control and reduce forest fuel buildup will benefit forested communities by reducing the potential for catastrophic stand replacing fire events.

***TRPA Code of Ordinances, Chapter 61 – Vegetation and Forest Health***

61.3.6.C: Sensitive Plants and Uncommon Plant Communities. Designation of plants for special significance is based on such values as scarcity and uniqueness. The following standards shall apply to all sensitive plants and uncommon plant communities referenced in the environmental thresholds, and to other plants or plant communities identified later for such distinction. The general locations of sensitive plant habitat and uncommon plant communities are depicted on the TRPA Special Species map overlay.

1. Sensitive Plants
  - a. List of Sensitive Plants

The sensitive plants are:

- (i) *Rorippa subumbellata* (Tahoe yellow cress);
- (ii) *Arabis rigidissima* var. *demote* (Galena Creek rock cress);
- (iii) *Lewisia longipetala* (long-petaled lewisia);
- (iv) *Draba asterophora* v. *macrocarpa* (Cup Lake draba);
- (v) *Draba asterophora* v. *asterophora* (Tahoe draba).

- b. Standards for Sensitive Plants Projects and activities in the vicinity of sensitive plants or their associated habitat shall be regulated to preserve sensitive plants and their habitat. All projects or activities that are likely to harm, destroy, or otherwise jeopardize sensitive plants or their habitat shall fully mitigate their significant adverse effects. Projects and activities that cannot fully mitigate their significant adverse effects are prohibited. Measures to protect sensitive plants and their habitat include, but are not limited to:

- (i) Fencing to enclose individual populations or habitat;
- (ii) Restrictions on access or intensity of use;
- (iii) Modifications to project design as necessary to avoid adverse impacts;
- (iv) Dedication of open space to include entire areas of suitable habitat; or
- (v) Restoration of disturbed habitat.

## 2. Uncommon Plant Communities

### a. List of Uncommon Plant Communities

The uncommon plant communities are:

- (i) The deep water plants of Lake Tahoe, Grass Lake (sphagnum fen);
- (ii) Osgood Swamp, Hell Hole (sphagnum fen);
- (iii) Pope Marsh, Taylor Creek Marsh, Upper Truckee Marsh;
- (iv) The Freel Peak cushion plant community.

### b. Standards for Uncommon Plant Communities

Uncommon plant communities shall be managed and protected to preserve their unique ecological attributes and other associated values. Projects and activities that significantly adversely impact uncommon plant communities, such that normal ecological functions or natural qualities of the community are impaired, shall not be approved.

## California Environmental Quality Act

Appendix G of the State CEQA Guidelines states that a significant effect would occur if:

- a project will substantially affect a rare, threatened or endangered plant or animal species or the habitat of the species;
- the project would adversely affect significant riparian, wetlands, marshes, or other wildlife habitat;

- the project would adversely affect a locally designated species or natural community; or
- the project would result in a barrier to wildlife dispersal or mitigation corridors.

For the purposes of this document, rare or endangered species are defined by Section 15380 of the State CEQA Guidelines as follows:

- "Endangered" when its survival and reproduction in the wild are in immediate jeopardy from one or more causes, including loss of habitat, change in habitat, overexploitation, competition, disease, or other factors; or
- "Rare" when either:
  1. Although not presently threatened with extinction, the species is existing in such small numbers throughout all or a significant portion of its range that it may become endangered if its environment worsens; or
  2. The species is likely to become endangered within the foreseeable future throughout all or a significant portion of its range and may be considered "threatened" as that term is used in the Federal Endangered Species Act.
- A species of plant shall be presumed to be rare or endangered as it is listed in:
  1. Title 14, California Administrative Code Sections 670.2 or 670.5, pursuant to the California Endangered Species Act or the California Native Plant Protection Act as rare, threatened or endangered.
  2. Title 50, Code of Federal Regulations Sections 17.11 or 17.12 pursuant to the Federal Endangered Species Act as rare, threatened, or endangered.
- A species not included in any listing identified above shall nevertheless be considered to be rare or endangered if the species can be shown to meet the criteria associated with "Endangered" or "Rare" species.

### **California State Plant Ranking System**

California Rare Plant Rank 1B: Plants Rare, Threatened, or Endangered in California and Elsewhere: Plants with a California Rare Plant Rank of 1B are rare throughout their range with the majority of them endemic to California. Most of the plants that are ranked 1B have declined significantly over the last century. California Rare Plant Rank 1B plants constitute the majority of taxa in the CNPS Inventory, with more than 1,000 plants assigned to this category of rarity

All of the plants constituting California Rare Plant Rank 1B meet the definitions of the California Endangered Species Act of the California Department of Fish and Game Code, and are eligible for state listing. Impacts to these species or their habitat must be analyzed during preparation of environmental documents relating to CEQA, or those considered to be functionally equivalent to CEQA, as they meet the definition of Rare or Endangered under CEQA Guidelines §15125; (c) and/or §15380.

## **National Environmental Policy Act**

Pursuant to the U.S. Council on Environmental Quality Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act (NEPA), the significance of an effect on the quality of the human environment is determined by considering the context in which it would occur and the intensity of the action. "Context" refers to the affected region and locality in which the action would occur. Significance, therefore, varies depending on the setting of the proposed action. "Intensity" refers to the severity of the impact. In determining the intensity of an impact to plants or vegetation communities, the following factors should be considered:

Unique Characteristics: An action which affects unique characteristics of the geographical area, such as wetlands and ecologically critical areas, would be considered to have a significant effect on the human environment.

Special-status Species: An action which adversely affects an endangered or threatened species or its habitat would be considered to have a significant effect on the human environment.

## **California Fish and Game Code Native Plant Protection Policy**

The goals of the Chapter 10 of the California Native Plant Protection Policy are as follows:

The intent of the Legislature and the purpose of this chapter are to preserve, protect, and enhance endangered or rare plants of this state (Section 1900). For purposes of this Chapter, a 'native plant' means a plant that grows in a wild uncultivated state, which is normally found native to the plant life of this state (Section 1901).

No person shall import into this state, or take, possess, or sell within this state, except as incident to the possession or sale of the real property on which the plant is growing, any native plant, or any part or product thereof, that the commission determines to be an endangered native plant or a rare native plant, except as otherwise provided in this chapter (Section 1908).

All state departments and agencies shall, in consultation with the department, utilize their authority in furtherance of the purposes of this chapter by carrying out programs for the conservation of endangered or rare native plants. Such programs include, but are not limited to, the identification, delineation, and protection of habitat critical to the continued survival of endangered or rare native plants (Section 1911).

## **Sierra Nevada Forest Plan Amendment**

The Record of Decision for the Final Supplemental Environmental Impact Statement outlines management Goals and Strategies for Old Forest, Meadow, and Riparian Ecosystems. For a discussion of Riparian and Meadow Goals and Strategies, please refer to VEG-5 which outlines the Riparian Conservation Objectives and desired conditions. Management Goals for Old Forest Ecosystems are as follows:

- The broad goals of the old forest and associated species conservation strategy are to:
- Protect, increase, and perpetuate desired conditions of old forest ecosystems and conserve species associated with these ecosystems while meeting people's needs for commodities and outdoor recreation activities;
- Increase the frequency of large trees, increase structural diversity of vegetation, and improve the continuity and distribution of old forests across the landscape; and
- Restore forest species composition and structure following large scale, stand-replacing disturbance events.

The Sierra Nevada Forest Plan Amendment (SNFPA) directs Region 5 forests to address “fens and bogs” as a botanical resource during project analyses and to maintain, restore, and/or enhance fens on National Forest System (NFS) lands (USDA 2004). Fens are ground-water dependent wetlands that are hotspots of biological diversity and provide habitat for rare plants such as *Meesia*, *Sphagnum*, and other bryophytes. Fens are among the most sensitive plant communities identified during ecological assessments of the Sierra Nevada (Sierra Nevada Ecosystem Project 1996; USDA 2004). There are 54 known fens within the LTBMU.

### ***Invasive Plants***

Invasive plants are a growing concern within the Sierra Nevada, as they are able to rapidly reproduce and spread, thereby invading and out competing native vegetation. Invasive plants can create detrimental effects on vegetation, soil, wildlife, riparian areas, and recreational opportunities, among others. Characteristics of invasive plants include: aggressive and difficult to manage, poisonous, toxic, parasitic, generally non-native, and a carrier or host of serious insects or disease.

Sierra Nevada Forest Plan Amendment established goals, standards, and guidelines for invasive plant (noxious weed) management for the Sierra Nevada forests. It emphasizes prevention and integrated weed management. It establishes the following invasive plant management prioritization: 1) prevent the introduction of new invaders; 2) conduct early treatment of new infestations; 3) contain and control established infestations. It also requires forests to conduct an invasive plant risk assessment to determine risks for weed spread (high, moderate, or low) associated with different types of proposed management activities and develop mitigation measures for high and moderate risk activities with reference to the weed prevention practices in the Regional Noxious Weed Management Strategy.

In 2011, Forest Service Manual direction (FSM 2900) clarified the difference between ‘noxious weed’—those plants designated on federal or state noxious weed lists and ‘invasive plant’—those alien species likely to cause economic, human health, or environmental harm. So while older documents may use the term ‘noxious weed’, the direction applies to all invasive plants on LTBMU.

Forest Service Manual 2080 (1995)—Was replaced by FSM 2900 in 2011. FSM 2080 revised USFS national policy on noxious weed management to emphasize integrated weed management, which includes prevention and control measures, cooperation, and information collection and reporting.

Forest Service Manual 2900 (2011)—directs the Forest Service to manage invasive species with an emphasis on integrated pest management and collaboration with stakeholders, to prioritize prevention and early detection and rapid response actions, and ensure that all Forest Service management activities are designed to minimize or eliminate the possibility of establishment or spread of invasive species on the NFS or to adjacent areas.

Forest Service Manual 2070 (2008)—provides guidelines for the use of native material on National Forest System lands. It restricts the use of persistent, non-native, non-invasive plant materials and prohibits the use noxious weeds for revegetation, rehabilitation and restoration projects. It also requires that all revegetation projects be reviewed by a trained or certified plant material specialist for consistency with national, regional, and forest policies for the use of native plant materials.

USFS National Strategy and Implementation Plan for Invasive Species Management (USDA 2004)—identifies for all Forest Service programs the most significant strategic actions for addressing invasive species. It emphasizes prevention, early detection and rapid response, prioritization in control and management, and restoration or rehabilitation of degraded areas.

Executive Order 13112 (1999)—directs federal agencies to prevent the introduction of invasive species; detect and respond rapidly to control such species; and to minimize the economic, ecological, and human health impacts from invasive species on public lands.

California Noxious and Invasive Weed Action Plan – Food and Agriculture Code (FAC) Division 4 (Plant Quarantine and Pest Control) provides quarantine authority against all weed pests under Sections 6305 (unlawful to transport seed pests), 6341 through 6344 (seed pests in shipments), or 6461 through 6465 (abatement, reshipment, or treatment). These sections allow for the rejection of shipments with “A” and “Q” -rated weed pests whenever found and rejection of “B” or “C”-rated weed pests based on the weed policy of individual counties. FAC Division 18, Chapter 2, Sections 52251 through 52515 (California Seed Law) regulate “noxious weed” (FAC Sect. 5004) seed found in agricultural or vegetable seed. The law allows for designation of “prohibited noxious weed seed” and “restricted noxious weed seed” for the adoption of standards and tolerances. Rejection and disposal of shipments, if not justified under quarantine action, may be based on label requirements that specify certain allowed levels or “tolerances” of weed seed contamination.

State of Nevada - Nevada Revised Statutes (NRS) State Laws protecting native species and the limitation placed on invasive species can be found in Forestry (Title 47) / Protection and Preservation of Timbered Lands, Trees and Flora(Chapter 527) / Control of Forest Insects and Diseases (527.130 et seq.) and Agriculture (Title 49) / Control of Insects, Pests and Noxious Weeds (Chapter 555) / Agricultural Products and Seeds (Chapter 587).

**Table 3.8-3**

**Evaluation Criteria and Points of Significance - Vegetation**

<b>Evaluation Criteria</b>	<b>As Measured By</b>	<b>Point of Significance</b>	<b>Justification</b>
1. Would the Project increase the risk of introduction or spread of invasive plants (aquatic or terrestrial)?	Abundance, habitat vulnerability, vectors not associated with Project, vectors associated with Project, prevention measures, habitat alteration	Introduction of new invasive plants and/or spread of existing invasive plant species resulting in a low, moderate or high risk of spread	FSM2900—Invasive Species SNFPLA 2004 ROD, Appendix A, Noxious weed direction FSM 2070—Vegetation Ecology Invasive plant resource assessment template LTBMU Forest Plan NRS Title 47 & 49 CA FAC Division 4 & 18
2. Would the Project result in an overall decrease in long term trends in Tahoe draba populations within the Project area?	a. Acres of draba occurrences  b. Acres of suitable habitat	CEQA and TRPA: a. Greater than 0 acres b. Greater than 0 acres  NEPA: Number of occurrences and the amount of suitable habitat impacted by proposed activities.	TRPA Threshold Carrying Capacities (Resolution # 82-11) TRPA Code of Ordinances Chapter 61.3.6.A FESA CESA (Sections 2062 and 2067) CEQA (Article 5, Section 15065) California Native Plant Protection Act (CDFG Code Sections 1900-1913) El Dorado County General Plan Objective 7.4.1 LTBMU Forest Plan
3. Would the project result in an increase to the risk/threat factors for listing of whitebark pine?	Long term trends in Whitebark Pine stand health within the Project area as measured by threat factors (fire and fire suppression, overutilization, disease, and inadequate regulatory mechanisms)	a. Change (increase) in level of threat factors (low, moderate, and high)	LTBMU Forest Plan USFWS – ESA ( <a href="http://www.fws.gov/mountain-prairie/species/plants/whitebarkpine/">http://www.fws.gov/mountain-prairie/species/plants/whitebarkpine/</a> )

**Table 3.8-3**

**Evaluation Criteria and Points of Significance - Vegetation**

<b>Evaluation Criteria</b>	<b>As Measured By</b>	<b>Point of Significance</b>	<b>Justification</b>
4. Would the project result in a loss of Threatened and Endangered, Proposed and Candidate, Forest Service Sensitive, or Nevada at Risk Botanical Species?	a. Acres of known occurrences b. Acres of new ground disturbance c. Number of occurrences impacted	CEQA and TRPA: a. Greater than 0 acres and 0 individuals b. Greater than 0 acres and 0 individuals NEPA: Number of occurrences and the amount of suitable habitat impacted by proposed activities.	TRPA Threshold Carrying Capacities (Resolution # 82-11) TRPA Code of Ordinances Chapter 61.3.6.A USFWS- ESA ( <a href="http://www.fws.gov/endangered/laws-policies/regulations-and-policies.html">http://www.fws.gov/endangered/laws-policies/regulations-and-policies.html</a> ) CESA (Sections 2062 and 2067) El Dorado County General Plan Objective 7.4.1 LTBMU Forest Plan
5. Would the project adversely affect other botanical resources (LTBMU watch list, uncommon plant list communities, SEZs or special aquatic features)?	a. Acres of known occurrences b. Acres of new ground disturbance c. Number of occurrences impacted	CEQA and TRPA: a. Greater than 0 acres and 0 individuals b. Greater than 0 acres and 0 individuals NEPA: Number of occurrences and the amount of suitable habitat impacted by proposed activities.	TRPA Code of Ordinances Chapter 61.3.3 CEQA (Article 5, Section 15065) CDFW Wildlife Habitat Relationships model - (Version 5.2) California Native Plant Protection Act CDFW Interim Wildlife/Hardwood Management Guidelines El Dorado County General Plan Objective 7.4.2 LTBMU Forest Plan
6. Would the Project result in the removal of any native live trees larger than 24-inch dbh, old forest (SNFPA) or late seral/old growth habitat as defined by TRPA or SNFPA?	Number of native live trees 30 inches or greater in dbh removed Acres of old forest/late seral/old growth habitat removed	Greater than 0 trees of this size removed Greater than 0 acres of habitat permanently removed	TRPA Environmental Checklist TRPA Code of Ordinances Chapter 61.1.4 TRPA Old Growth Threshold SNFPA El Dorado County General Plan Objective 7.4.4 LTBMU Forest Plan

Source: HBA 2014

CDFW California Department of Fish and Wildlife  
CEQA California Environmental Quality Act  
CESA California Endangered Species Act  
CNDDB California Natural Diversity Data Base  
CNPS California Native Plant Society

FESA Federal Endangered Species Act  
TRPA Tahoe Regional Planning Agency  
USFWS United States Fish and Wildlife Service

## **Analysis Methodology and Assumptions**

The analysis of effects on TEPCS botanical species was a three-step process (FSM 2672.43; USDA 2005). In the first step, all TEPCS species that were known or were believed to have potential to occur in the analysis area were identified. This list was developed by reviewing the U.S. Fish and Wildlife List for LTBMU (USFWS 2013), USDA Forest Service Region 5 Sensitive Species List (USDA 2013), LTBMU rare botanical species records and vegetation maps, California Natural Diversity Database records (CNDDDB 2014), and Nevada Natural Heritage Program records (NNHP 2014).

The second step was field reconnaissance surveys. To date, field surveys have been conducted on approximately 700 acres within the botany analysis area, including where activities are proposed. Element occurrences for Tahoe draba were revisited and remapped in 2014. Survey results are on record at LTBMU office. For those areas outside of the surveyed areas, but within the botany analysis area, species occurrence information was compiled using CNDDDB (2014) and NNHP (2014) database records, LTBMU rare botanical species records, and past survey reports.

Field surveys were designed around the flowering period and ecology of the TEPCS identified in step one. For each TEPCS occurrence found, information was collected that described the size of the occurrence and habitat characteristics and identified any existing or potential threats. Location information was collected using a Global Positioning System (GPS).

All of this information was used in step three of the analysis—effects analysis. TEPCS and project activity data were imported into a Geographic Information System (GIS) and used to analyze proximity to the proposed activities, identify direct and indirect effects, and develop resource protection measures.

## **Data Sources**

Basic information describing the life history, ecology, pollination biology, and specific habitat requirements is lacking for most of the sensitive species that occur within the botany analysis area. The scientific literature and internal government documents (i.e. species-specific conservation assessments) were utilized for the analysis whenever available; however more frequently the analysis of effects was based on observations by qualified individuals, field experience, unpublished monitoring results, and studies of comparable species.

### 3.8-4 ENVIRONMENTAL IMPACTS

**IMPACT: VEG-1: Would the Project increase the risk of introduction or spread of invasive plants (aquatic or terrestrial)?**

Table 3.8-4 identifies invasive plants of management concern in the Project area.

**Table 3.8-4**

#### LTBMU and STATE INVASIVE PLANTS OF MANAGEMENT CONCERN

Scientific Name	Common Name	LTBMU Priority	NDA	CD FA	Cal-IPC	LTB WCG	Known in Project
<i>Acroptilon repens</i>	Russian knapweed	Medium	B	B	Moderate	Group 1	N
<i>Ailanthus altissima</i>	tree of heaven	N/A		C	Moderate	Group 1	N
<i>Bromus tectorum</i>	cheat grass	Low			High		N
<i>Cardaria draba</i>	heart-podded hoary cress; whitetop	Medium	C	B	Moderate	Group 1	N
<i>Cardaria pubescens</i>	globe-podded hoary cress; hairy whitetop	Medium		B	Limited	Group 1	N
<i>Carduus nutans</i>	musk thistle	High	B	A	Moderate	Group 1	N
<i>Centaurea calcitrapa</i>	purple starthistle; red starthistle	N/A	A	B	Moderate	Group 1	N
<i>Centaurea diffusa</i>	diffuse knapweed	Medium	B	A	Moderate	Group 1	N
<i>Centaurea maculosa</i>	spotted knapweed	Medium	A	A	High	Group 2	N
<i>Centaurea solstitialis</i>	yellow starthistle	Medium	A	C	High	Group 1	N
<i>Centaurea virgata</i> ssp. <i>squarrosa</i>	squarrose knapweed	Medium	A	A	Moderate		N
<i>Chondrilla juncea</i>	rush skeletonweed	High	A	A	Moderate	Group 1	N
<i>Cirsium arvense</i>	Canada thistle	Medium	C	B	Moderate	Group 1	Y
<i>Cirsium vulgare</i>	bull thistle	High		C	Moderate	Group 2	N
<i>Conium maculatum</i>	poison hemlock	Medium	C		Moderate		N
<i>Cytisus scoparius</i>	Scotch broom	Medium		C	High	Group 2	N
<i>Dipsacus fullonum</i>	teasel; Fuller's teasel	N/A			Moderate	Group 1	N
<i>Dittrichia graveolens</i>	stinkwort	N/A			Moderate	Group 1	N
<i>Elytrigia repense</i>	quackgrass	N/A		B			N
<i>Hydrilla verticillata</i>	hydrilla; waterhyme	N/A	A	A	High; Alert		N
<i>Hypericum perforatum</i>	St. Johnswort; Klamathweed	Medium	A	C	Moderate	Group 2	N
<i>Isatis tinctoria</i>	Dyer's woad	Medium	A	B	Moderate	Group 1	N
<i>Lepidium latifolium</i>	tall whitetop; perennial pepperweed	Medium	C	B	High	Group 2	Y
<i>Leucanthemum vulgare</i>	oxeye daisy	Medium			Moderate	Group 2	N
<i>Linaria genistifolia</i> spp. <i>dalmatica</i>	Dalmatian toadflax	High	A	A	Moderate	Group 2	N
<i>Linaria vulgaris</i>	yellow toadflax; butter & eggs	Medium	A		Moderate	Group 2	N
<i>Lythrum salicaria</i>	purple loosestrife	Medium	A	B	High	Group 1	N

Scientific Name	Common Name	LTCMU Priority	NDA	CD FA	Cal-IPC	LTC WCG	Known in Project
<i>Myriophyllum spicatum</i>	Eurasian watermilfoil	N/A	A		High		N
<i>Onoropordum acanthium</i> ssp. <i>acanthium</i>	Scotch thistle	High	B	A	High	Group 1	N
<i>Potamogeton crispus</i>	curlyleaf pondweed	N/A			Moderate		N
<i>Potentilla recta</i>	sulfur cinquefoil	Low	A	A		Group 1	N
<i>Rubus armeniacus</i>	Himalaya blackberry	Low			High		N
<i>Elymus caput-medusae</i>	medusahead	High	B	C	High	Group 1	N
<i>Tamarix chinensis</i> , <i>T.</i> <i>ramosissima</i> , & <i>T. parvifolia</i>	tamarisk; saltcedar	High	C	B	High	Group 1	N
<i>Verbascum thapsus</i>	woolly mullein; common mullein	N/A			Limited		N

Source: Forest Service, 2014

#### Notes

**LTCMU:** High—Species that have a large ecological impact or invasive potential; species that are easily controlled. Medium—Species that have a moderate ecological impact or invasive potential; species that may be difficult to control. Low—Species that have a low ecological impact or invasive potential; species that require substantial effort to control. N/A—species not evaluated.

**NDA:** Nevada Department of Agriculture Noxious Weed List ([http://agri.nv.gov/nwac/PLANT\\_NoWeedList.htm](http://agri.nv.gov/nwac/PLANT_NoWeedList.htm)) Category A—Weeds not found or limited in distribution throughout the state; actively excluded from the state and actively eradicated wherever found; actively eradicated from nursery stock dealer premises; control required by the state in all infestations. Category B—Weeds established in scattered populations in some counties of the state; actively excluded where possible, actively eradicated from nursery stock dealer premises; control required by the state in areas where populations are not well established or previously unknown to occur. Category C—Weeds currently established and generally widespread in many counties of the state; actively eradicated from nursery stock dealer premises; abatement at the discretion of the state quarantine officer.

**CDFA:** California Department of Food and Agriculture Noxious Weed List (<http://www.cdca.ca.gov/phpps/IPC/>). A--Eradication or containment is required at the state or county level. B—Eradication or containment is at the discretion of the County Agricultural Commissioner. C--Require eradication or containment only when found in a nursery or at the discretion of the County Agricultural Commissioner. Q—Require temporary “A” action pending determination of a permanent rating.

**Cal-IPC:** California Invasive Plant Council Online Invasive Plant Inventory (2006) (<http://www.cal-ipc.org/ip/inventory/weedlist.php>). High—Species having severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. Moderate—Species having substantial and apparent—but generally not severe—ecological impacts on physical processes, plant and animal communities, and vegetation structure. Limited—Species that are invasive but their ecological impacts are minor on a statewide level or there was not enough information to justify a higher score. Alert—Species with significant potential for invading new ecosystems.

**LTCWCG:** Lake Tahoe Basin Weed Coordinating Group Weed Priority List (2010). Group 1--Watch for, report, and eradicate immediately. Group 2--Manage infestations with the goal of eradication.

Invasive plants have been documented at Heavenly Mountain Resort. A total of 10 infestations have been identified (USFS ID Sites #169, #170, #294A, 294, B, 294 C, #296, #439, #364 and #613). Of the 10 infestations, four are located within Epic Discovery Project areas or in the immediate vicinity (Sites #439, #169, #296, and #364). Table 3.8-5 identifies the invasive species sites that are within or adjacent to projects in the Proposed Action and Alternatives.

**Table 3.8-5**

**Known Invasive Species Sites Associated with Epic Discovery Projects**

<b>Epic Discovery Project</b>	<b>Invasive Site #</b>	<b>Invasive Species Present (# of plants observed/year)</b>	<b>Status of Site</b>	<b>Risk</b>
Mountain Excursion Tour	#296	Tall Whitetop (15/2010, 6/2011, 30/2012, 30,2012)	Active	High risk of spread from human vectors present.
Mountain Excursion Tour	#169	Tall Whitetop (40/2011, 0/2012, 0/2013)	Inactive	Moderate risk of spread from vehicular travel/vectors.
Mountain Excursion Tour	#364	Canada Thistle (2005)	Inactive	Low risk of spread from vehicular travel/vectors.
Sky Meadows Zipline Canopy Tour	#296	Tall Whitetop (15/2010, 6/2011, 30/2012, 30,2012)	Active	High risk of spread from human vectors present.
Mountain Bike Park	#439	Canada Thistle (0/2011, 0/2012, 0/2013)	Inactive	Low risk of spread from bicycles/human/vehicular vectors.
Sky Basin Coaster (Alternative)	#296	Tall Whitetop (15/2010, 6/2011, 30/2012, 30,2012)	Active	High risk of spread from human vectors present.

HBA 2015

Table 3.8-6 outlines the tree removal proposed for the proposed project, Alternative 1 and Alternative 2. It also documents permanent and temporary ground disturbance that would result from Project construction.

**Table 3.8-6**

**Epic Discovery Project Tree Removal and Ground Disturbance**

Activity	Tree Removal	Ground Disturbance		
	Forest Clearings (acres)	Permanent Disturbance (sf)	Temporary Disturbance (sf)	Perm+Temp Disturbance (sf)
<b><i>Proposed Action</i></b>				
<b><i>Adventure Peak</i></b>				
Alpine Coaster Forest Flyer	0.70			
Buildings (Terminal, bull wheels, attendant's shed)		3,170		3,170
Coaster		1,256	70,000	71,256
Trails		810		810
Parking		432		432
Sky Cycle	1.93			
Structures		1,511		1,511
Trails and Queuing Areas		18,255	16,729	34,984
Maintenance Road		4,898		4,898
Mid Station Canopy Tour	1.91			
Trails and Queuing Areas		11,538	20,960	32,498
Structures		80		80
In-fill Activities				
Kid Zipline and Disc Golf Trails		3,938	7,340	11,278
Mountain Bike Skills Park		15,182		15,182
Concrete Pad for Bike Rental Area		2,000		2,000
<b><i>Total Adventure Peak</i></b>	4.54	63,070	115,029	178,099
<b><i>East Peak Basin</i></b>				
East Peak Lodge Hiking Trail		11,988	23,976	35,964
Mountain Bike Park		247,314	278,458	525,772
East Peak Canopy Tour	1.48			
Trails		6,132	9,504	15,636
East Peak Water Activities Access				
Trail		532	532	1,064
<b><i>Total East Peak Basin</i></b>	1.48	265,966	312,470	578,436
<b><i>Sky Meadows Basin</i></b>				
Sky Meadows Canopy Tour	4.12			
Trails and Queuing Areas		24,318	46,140	70,458
Sky Meadows Challenge Course				
Trails		138	176	314
Mountain Excursion Tour				
Parking/Pullouts		440		440
Ridge Run Lookout Tower				
Sky Express Deck Expansion		1,000		1,000
Structures		992		992
Parking/Pullouts		440		440
Trails		656	4,264	4,920
<b><i>Total Sky Meadows Basin</i></b>	4.12	27,984	50,580	78,564

**Table 3.8-6**

**Epic Discovery Project Tree Removal and Ground Disturbance**

Activity	Tree Removal	Ground Disturbance		
	Forest Clearings (acres)	Permanent Disturbance (sf)	Temporary Disturbance (sf)	Perm+Temp Disturbance (sf)
<b>Other Activities</b>				
Gondola Evacuation Route	4.70			
Panorama Trail		132,150		132,150
Panorama to Gondola Mid Station Trail		11,100		11,100
<b>Total Disturbance (Proposed Action)</b>	<b>14.84</b>	<b>500,270</b>	<b>478,079</b>	<b>978,349</b>
<i>Acres</i>		<i>11.48</i>	<i>10.98</i>	<i>22.46</i>
<b>Alternative 1</b>				
<b>Sky Meadows Alpine Coaster</b>	2.50			
Buildings (Terminal, bull wheels, attendant's shed)		1,690		1,690
Coaster		2,340	199,000	201,340
Trails		2,630		2,630
<b>Total Disturbance (Alt 1)</b>	<b>16.64</b>	<b>501,262</b>	<b>607,079</b>	<b>1,108,341</b>
<i>Acres</i>		<i>11.51</i>	<i>13.94</i>	<i>25.44</i>
<b>Alternative 2</b>				
<b>Remove Sky Meadows Challenge Course</b>				
Trails		138	176	314
<b>Total Disturbance (Alt 2)</b>	<b>14.84</b>	<b>500,132</b>	<b>477,903</b>	<b>978,035</b>
<i>Acres</i>		<i>11.48</i>	<i>10.97</i>	<i>22.46</i>

Source: RCI 2014

## Inventory

The existing infestation of tall whitetop (*Lepidium latifolium*) located at the top of Tamarack Express lift (#296) has the potential to spread using humans and vehicles as vectors. The three projects located in this vicinity are the Sky Basin Coaster (Alternative), Sky Meadows Zipline Canopy Tour, and the Excursion Tour. Guests will be arriving at the top of Tamarack Lift to access the Sky Meadows Zipline Canopy Tour and the Sky Basin Coaster (Alternative). Increased human presence in the area increases the chances for the spread of seed from these invasive plants (noxious weeds) to the surrounding area that contains Tahoe draba habitat.

The tall whitetop located at the top of Sky Express lift (#169) has not been active since 2011 and has moderate potential for spreading due to the Mountain Excursion Tour driving adjacent to the site location. The Mountain Excursion Tour also occurs adjacent to site #364 which contains Canada thistle located at the Sky Meadows area, which is also a low risk infestation.

The trails associated with the Mountain Bike Park terminate at East Peak Reservoir, adjacent to inactive infestation #439. This infestation has a low potential for spread as no plants have been detected in this location in the last three years.

### **Habitat Vulnerability**

The elevation of the project area is 9,500-10,000 ft. The dominant plant communities in the project area are mixed conifer, whitebark pine, and lodgepole pine. In general, subalpine forests with a developed canopy exhibit low vulnerability to invasive plant establishment. However, there are also large areas cleared of native vegetation and with a high level of disturbance from existing use as a recreation center. Invasive plants are often classified as ‘pioneer’ species and are some of the first species to establish themselves in disturbed areas. Disturbance can create ideal conditions for introduction and spread due to the removal of natural barriers that keep invasive species in check, such as unfavorable light, soil, or moisture conditions (Parendes and Jones 2000). There are minor crossing of riparian zones by the proposed projects associated with the Sky Basin Coaster and also projects associated with the East Peak Lake Water Activities. The overall habitat vulnerability is moderate, due to the presence of both low (subalpine forest) and high (disturbed or developed areas) vulnerability habitats.

### **Non-Project Dependent Vectors**

Vectors such as roads, trails, utility lines, recreational activities (e.g. camping, hiking, horseback riding, and hunting), and ongoing land management activities can spread invasive plants through the transport of weed seed.

The area is a heavily developed recreation center with several ski trails, access roads, footpaths, and existing recreation facilities, including three existing ski lodges, numerous chairlifts, and a tubing center. It is an area of very high visitor use in both the summer and winter. Heavenly Mountain Resort is both a regional and international destination with visitors arriving from all over the world, which increases the risk of non-native exotic species introduction, as visitors may carry seed home their homes to Heavenly on their clothing, shoes, and gear.

Those habitats within the botany analysis area that are located next to roads and trails are at a high risk of weed invasion and spread. Road and trail density is considered high throughout the project area. Roads and trails provide dispersal of invasive species via three mechanisms: providing habitat by altering conditions, making invasion more likely by stressing or removing native species, and allowing easier movement by wild or human vectors (Trombulak and Frissell 2000). The above listed activities contribute to the high risk of invasive plant invasion from non-project dependent vectors. The risk of spread is moderate due to the relative low number of invasive plant occurrences within the project area.

### **Habitat Alteration**

The construction of new facilities will result in permanent habitat alteration in their footprint. However, the overall footprint of permanent alteration for the

proposed project is 11.48 acres (10.98 acres of temporary disturbance that is to be restored). Alternative 1 is 11.51 acres (13.94 acres temporary disturbance) and Alternative 2 is 11.48 acres (10.97 acres temporary disturbance). In a unit-wide (LTBMU) context, this is a moderately-sized project; the habitat alteration is less than 20 acres. Near new facilities, there will be temporary removal of native vegetation and heavy soil disturbance. Depending on the degree of visitor impact, some temporary removal of vegetation may become permanent, if continued visitor use restricts the reestablishment of native vegetation through trampling of seedlings or soil compaction resulting in unfavorable establishment conditions.

The Proposed Action includes facilities that will result in a high degree of habitat alteration that include direct removal of trees and vegetation and ground disturbance. Those projects include the Forest Flyer Alpine Coaster, Mountain Bike Park, East Peak Lodge Hiking Trail, Ridge Run Lookout Tower and Observation Deck, Connecting Trails and Emergency Gondola Snow Cat Evacuation Route.

The facilities that will result in low or temporary habitat alteration are those that are located in existing disturbed and/or developed areas, or are located in the canopy of the forest and therefore do not result in modifications to forest floor habitat. Those facilities include the Mid-Station Zipline Canopy Tour, Sky Cycle Canopy Tour, Forest Flyer Alpine Coaster, Smaller Infill Activities, East Peak Zipline Canopy Tour, East Peak Reservoir Water Activities, Interpretive Activities at East Peak Lodge, Sky Meadows Zipline Canopy Tour, Sky Meadows Challenge Course, Interpretive Activities at Sky Deck, Educational Opportunities and Interpretive Information, and the Mountain Excursion Tour.

There is a high risk of habitat alteration from the project and alternatives, though the overall disturbed area is moderate on a unit-wide scale.

### **Increased Vectors as a Result of Project**

The project is purposefully designed to increase visitor usage of the area (Chapter 2 Epic Discovery EIS). This will increase the risk of introduction of invasive plants, as visitors may transport weed seed. Due to the regional and international origin of many visitors to the new proposed facilities, there is a particular risk of the introduction of species not currently known on the LTBMU.

Heavy equipment used during construction also presents a substantial vector for weed introduction. If equipment was previously used in infested areas and then transported and used on the project site, there is a high risk of invasive plant introduction. Much of the equipment used for projects on the LTBMU arrives from the Sacramento and Carson Valleys, which are much more heavily infested than LTBMU lands; so, this equipment poses a particular risk, unless it is cleaned prior to arriving at the project area.

The Proposed Action and Alternative 2 have the same amount of total ground disturbance and number of projects minus the Sky Meadows Challenge Course for Alternative 2. Little to no difference of increased vectors will result between these alternatives. Alternative 1 includes the Sky Basin Coaster, which is larger

than the Forest Flyer Alpine Coaster and therefore has the potential to increase weed introduction through the increased area of total disturbance (25.44 acres as compared with 22.46 acres for Alt 2 and the Proposed Action).

In order to mitigate dust during construction, sometimes water is sprayed on roads and construction areas. If water is drafted from sources containing aquatic invasive plants and sprayed on streams, riparian areas, or wetlands, it can act as a vector for spreading invasive plant species. However, because no riparian or wetland areas will be watered in the project areas, this is negligible risk of introducing aquatic invasive plants. There is a high risk of increased vectors as a result of Epic Discovery Project and alternatives through increased human visitation and construction equipment use in the project area. Alternative 1 has a slightly higher risk as compared to Alternative 2 and the Proposed Action due to larger disturbance area.

Invasive plant occurrences can result in negative impacts to all ecosystems, although different habitats may be invaded by different invasive plant species. Epic Discovery projects at Heavenly have a moderate risk to spread tall whitetop and Canada thistle, which has been documented within the project areas. Invasive plant occurrences can lead to changes in habitat characters that are detrimental to sensitive plant species. Standard management requirements such as inventory, avoiding infestation areas during ground disturbing activities, and using weed free nursery material (Chapter 5, MMP Invasive Plant Management) will be utilized to greatly reduce the threat from invasive plant establishment and infestation.

The potential exists for indirect impacts due to revegetation efforts as invasive plant material being present. Revegetation efforts will facilitate recovery of disturbed areas by reducing erosion and improving vegetation structure by enhancing native species. Revegetation efforts will be implemented in the areas surrounding project installation of structures associated with the Forest Flyer Coaster, Sky Cycle Canopy Tour, Sky Basin Coaster (Alternative) and the Ridge Run Lookout Tower. Potential impacts to habitat may result due to the introduction of invasive plants.

Native vegetation associations can be negatively impacted as a result of invasion of invasive plants. Changes in habitat may result once invasive plants become established. Invasive species are often more vigorous than native species and provide competition for water, light and nutrient resources. Changes in vegetation structure, decreased soil stability and impacts on fire regimes can also occur as a result of invasive plant infestation. Once invasive plants become established, control efforts can also negatively impact native species, through trampling, damage from digging and soil disturbance (NISC, 2008).

During implementation and operations under their Master Plan, Heavenly Mountain Resort is required to implement mitigation measure 7.5-24 Invasive Plant Management mountain wide. This design feature requires the continued treatment of known noxious weeds and invasive species.

The 2007 MPA provides the invasive plant management measures for all projects implemented as part of the Master Plan. The invasive plant measures in the 2007 MPA are as follows:

- 1. As a term and conditions of Heavenly Mountain Resort's Special Use Permit, Heavenly will develop a long-term integrated weed management plan. This plan should include annual monitoring associated with existing weed infestations and new project construction. Plans should include control and abatement plans, restoration and revegetation plans, and annual reporting requirements (weed treatments, infestation sizes, and locations will be reported). Currently, three noxious weed species are located within Heavenly Mountain Resort's boundary on both Forest Service and privately owned land: tall whitetop (*Lepidium latifolium*), Canada thistle (*Cirsium arvense*) and bull thistle (*Cirsium vulgare*).*
- 2. Summertime maintenance and excavation equipment vehicles used for project implementation should be weed free and cleaned of all attached mud, dirt, and plant parts before entering the project area. This practice shall be done at a vehicle washing station or steam cleaning facility (power or high-pressure cleaning) before the equipment and vehicles enter the project area.*
- 3. Equipment, materials, or crews shall not be staged in noxious weed infested areas.*
- 4. All gravel, fill, mulches or other materials should be weed free. Use onsite sand, gravel, rock or organic matter where possible. Otherwise, obtain materials from gravel pits and fill sources that have been determined to be weed-free by the Forest Service Noxious Weed Coordinator. Topsoil from disturbance will be saved and put back to use in onsite revegetation, unless contaminated with noxious weeds. All activities that require seeding or planting should use locally collected native seed sources whenever possible. Plant and seed material should be collected from as close to the project area as possible, from within the same watershed and at a similar elevation whenever possible. Persistent non-natives such as timothy (*Phleum pretense*), orchardgrass (*Dactylis glomerata*), or ryegrass (*Lolium sp.*) should be avoided. Seed mixes should be approved by Forest Service Botanists.*
- 5. Weed infestations identified before project implementation that are within the project area should be treated or "flagged and avoided" according to the species present and project constraints.*
- 6. Construction areas should be monitored for 3 years post-project to ensure that no new weed infestations move into the area disturbed during project implementation.*
- 7. Heavenly will implement an annual employee orientation and training program for employees that work in ground disturbing activities. Training could include an introduction to the noxious weeds currently present on*

*the mountain, (tall whitetop, Canada thistle, and bull thistle), photographs of the weeds, a map identifying known weed locations, and a list of the mitigation measures being implemented to eradicate the noxious weeds.*

## **CEQA and TRPA**

**Analysis:** *Less Than Significant; Proposed Project and Alternatives*

There are known populations of invasive plant species that occur within the Project Area as noted above. Standard management measures and existing mitigation measure 7.5-24 (Invasive Plant Management) are included in the Proposed Action to mitigate impacts to known rare plant species and habitats from invasive species. Based on the inclusion of recommended mitigation measures in the Proposed Action and Alternatives that would require continued treatment of known sites and measures to prevent the spread of invasive species, this impact is considered to be less than significant.

## **NEPA**

**Analysis:** *No Adverse Effects; Proposed Project and Alternatives*

There are known populations of invasive plant species that occur within the Project Area as noted above. MPA 07 design features and MP 96 mitigation measures are included in the Proposed Action to mitigate adverse effects to known rare plant species and habitats from noxious weeds and invasive species. The inclusion of recommended design features in the Proposed Action and Alternatives that would require continued treatment of known sites and measures to prevent the spread of invasive species reduce the risk to the level that no adverse effects will occur that would result in the increase of spread of invasive species.

**IMPACT: VEG-2 Would the Project result in an overall decrease in long term trends in Tahoe draba populations within the Project area?**

This perennial forb is restricted to alpine talus slopes and occurs in a discontinuous distribution from Mt. Rose in Washoe County, Nevada to Mt. Gibbs near Tioga Pass in Yosemite, California (CNDDDB 2014). There are approximately eight occurrences known from USFS and state lands on Mt. Rose in Nevada, and Heavenly Ski Resort, Freel Peak, and Job's Sister in California (CNDDDB 2014, NNHP 2014); at least two occurrences may warrant recognition as a separate variety, effectively reducing taxa's extent to six occurrences (Putnam 2013). There are four known occurrences (40 sub-occurrences) on LTBMU which consist of an estimated 19,500 plants.

Tahoe draba (*Draba asterophora* var. *asterophora*) is known to occur in a total of 15 sub-occurrence locations within the botany analysis area that is described and mapped in the Biological Evaluation prepared for the Epic Discovery Projects. Of these 15 sub-occurrence locations, a total of five sub-occurrences are within or immediately adjacent to two activities included in the Proposed Action and one activity included in the Alternatives. Table 3.8-7 outlines these occurrences in relation to the projects that may impact Tahoe draba. Locations of the Element Occurrences are represented in Figure 3.8-1.

**Table 3.8-7**

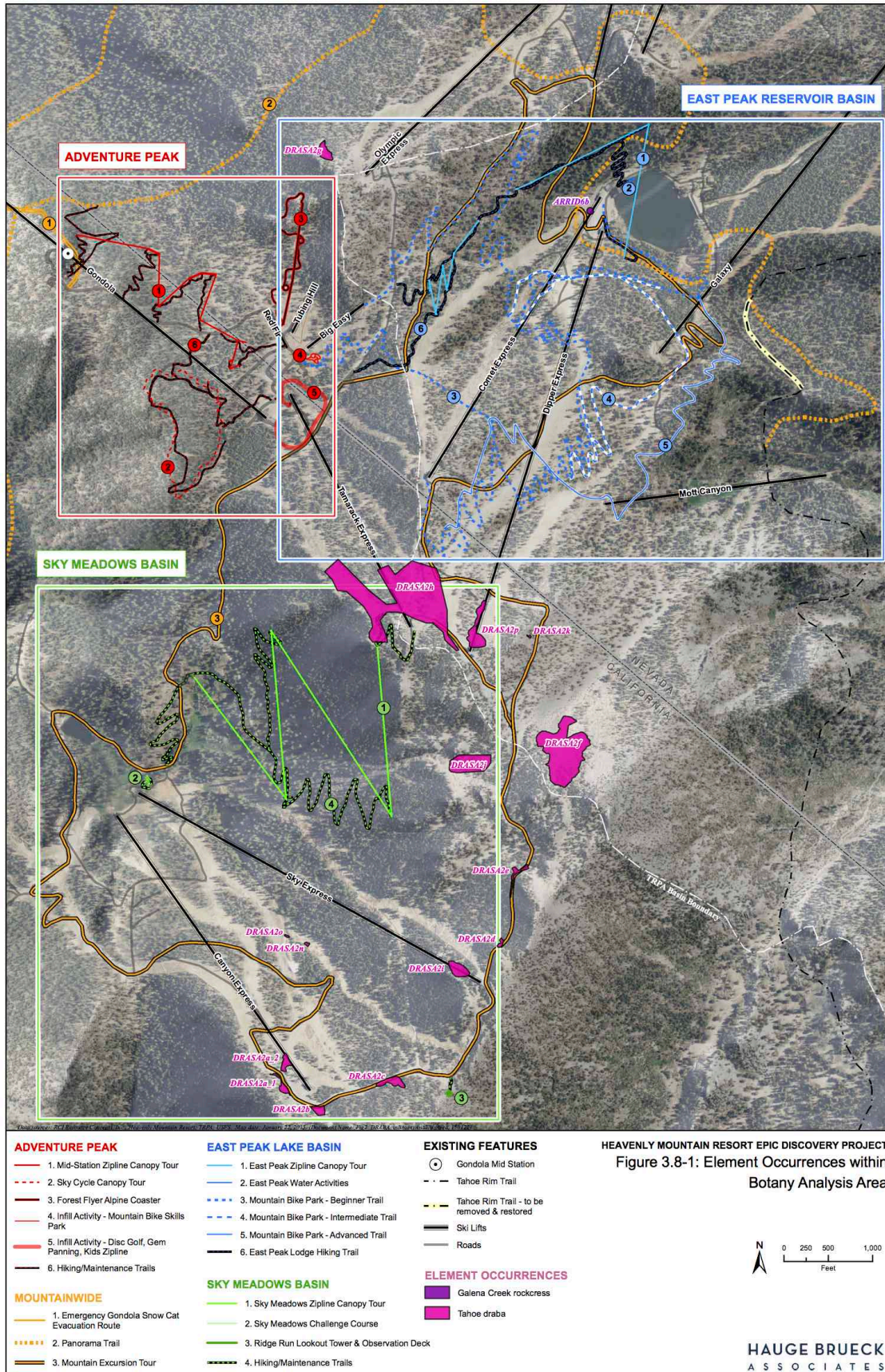
Tahoe Draba Occurrences Impacted by Epic Discovery Projects

Tahoe Draba Occurrence #	# of Tahoe draba plants	Mountain Excursion Tour	Sky Zipline Canopy Tour	Sky Basin Coaster (Alternative)
DRASAA	250-499	X		
DRASAb	800	X		
DRASAc	1150	X		
DRASAE	500-999	X		
DRASAh	1500-2000	X	X	X

Source: USFS LTBMU Database NRIS 2014

**Direct Effects:**

Three of the proposed activities are located within or in close proximity of existing Tahoe draba occurrences: Sky Meadows Zipline, Sky Basin Coaster (Alternative), and the Mountain Excursion Tour.



The Sky Meadows Zipline and the Sky Basin Coaster (Alternative 1) both have access trails that lead from the top of Tamarack Lift to the top of each of the projects. The existing trail leads from the top of Tamarack lift directly approximately 300 feet to the top of the Sky Basin Coaster. This area contains historical Tahoe draba transplant locations and seed plots that were created as mitigation during the installation of Tamarack lift in 1999 (HBA 2007). The second portion of the trail starts at the end of the access roadway that terminates at the top of California Trail, where it turns south toward the top of the Sky Zipline Canopy Tour and the Sky Basin Coaster (Alternative 1). This portion of the trail is located in occurrence DRASA2h that contains 1500-2000 plants and is approximately 532 feet in distance. As noted in the Proposed Action (Section 2.3.5 of the EIS) the trails have been modified to avoid existing plants and to limit disturbance to suitable habitat, for all Alternatives. Boardwalks in suitable habitat are being proposed to avoid impacts to the habitat and to avoid direct impacts to individuals. Additionally, Resource Protection Fencing is being proposed for all activity areas that are adjacent to known draba occurrences. A map identifying the locations of the fencing and boardwalks is found in Figure 2-9.

With the inclusion of the resource protection fencing and boardwalk design features trampling of individual Tahoe draba plants by visitors will not occur as a result of increased visitor use of hiking trails located near or through Tahoe draba occurrences. There are approximately 643 feet of trail through known EO and 831 feet of trail through unoccupied suitable habitat in the Proposed Action, Alternative 1 and Alternative 2. Past fencing along the summer roadways in the areas of Tahoe draba (DRASA2a, DRASA2b, DRASA2c, DRASA2d, DRASA2e) have been metal project stakes used to hold up a rope line. The updated resource protection fencing requirement will effectively prevent vehicular and human access in the area.

The Mountain Excursion Tour, as described in Chapter 2 of the EIS, utilizes the summer access roadways that connect the top of the Nevada and California sides of Heavenly Mountain Resort. The summer roadway (Skyline Trail) that connects the two sides traverses along the ridge line just to the west of Monument Peak. A total of five Tahoe draba occurrences are located adjacent to the roadway (DRASA2a, DRASA2b, DRASA2c, DRASA2d, DRASA2e). All five of these occurrences have plants growing along the cut and fill slopes immediately adjacent to the roadway. The vehicles to be used for the Mountain Excursion Tour will not have the ability to impact individuals by crushing plants along the road edge during operation due to the design features noted above. The roadways are currently utilized by hikers as well as maintenance vehicles during the summer months. Existing mitigation measure 7.5-21 *Protect Tahoe Draba Populations within Heavenly Mountain Resort* (MPA 2007 EIS) and design features (Chapter 2.3.5) require the use of fencing around known populations to protect Tahoe draba. The fencing required is to be four feet in height and will prevent impacts to the occurrences from trampling and compaction from driving.

### **Indirect Effects:**

The potential for increased human traffic along the summer roadways and new trails increases the potential for impacts to Tahoe draba in the form of habitat. Suitable draba habitat exists along the summer access roadway and may be degraded by vegetation trampling (visitors on foot or by vehicles) and dust from the increased vehicle use that may hinder vegetation growth or reproduction (Trombluak and Frissel 2000.)

Based on DNA and cytological studies performed by Putnam (2013), the *Draba asterophora* complex “appears to be composed of three separately evolving trajectories” based on separate geographic locations/regions surrounding Lake Tahoe. Based on the information contained in this study, it is recommended each population cluster (Heavenly and Freer Peak is one such cluster) should be treated as a distinct taxonomic entity. This information relates to the fragile nature of Tahoe draba and outlines the need for conservation and protection of existing individuals. Additionally, the populations of Tahoe draba in the study were currently found to be stable, all populations were relatively small, with low densities, exhibited low fecundity and were located in narrow geographic boundaries (Putnam 2013). These factors do not allow for the rapid re-population of this species after disturbance and further put the species at risk as a result of habitat loss and loss of individuals. Fragmenting an already isolated population may result in increased pressures on re-population after disturbance. Protection of existing adult plants is considered vital to the persistence of the species (Putnam 2013). There are approximately 643 feet of trail through known EO and 831 feet of trail through unoccupied suitable habitat in the Proposed Action, Alternative 1 and Alternative 2. Fragmentation of known EO has more of an impact than unoccupied suitable habitat and therefore the installation of boardwalk is important to maintain the continuity of existing occupied habitat.

Increased disruption of Tahoe draba habitat through the installation of trails that bisect and fragment habitat may result in indirect impacts to the existing population located within the resort. As noted above, Tahoe draba is confined to relatively narrow geographic boundaries in the form of “relatively open north-facing alpine habitats on steep granitic slopes” (Putnam 2013). The bisection of suitable habitat (while not directly impacting any individuals) has the potential for detrimental indirect effects to the species in the form of habitat loss and increased disturbance through compaction and human disturbance. Total suitable habitat for Tahoe draba within the Special Use Permit Boundary is 1776.72 acres (LTBMU GIS). The limited suitable habitat for Tahoe draba should be avoided to the extent possible to preserve the existing population cluster located within the resort. Inclusion of the resource protection fencing (as shown in Figure 2-9) will prevent impacts to existing adult plants and seedlings in the following occurrences: (DRASA2a, DRASA2b, DRASA2c, DRASA2d, DRASA2e) from the Mountain Excursion Tour and hikers by eliminating access. Boardwalks in suitable draba habitat within occurrence DRASA2h will allow for the protection

of existing adult plants and will allow for the continuity of habitat and will not result in further fragmentation.

The project and Alternatives have the potential to affect 13% (5 of 40 total) of the known sub-occurrences on the LTBMU. A total of eight element occurrences are known for Tahoe draba in the basin. Of the eight, two may be recognized as a separate variety located on Relay Peak and Mt. Rose, thereby reducing the variety located at Heavenly Mountain Resort down to six. At least one other element occurrence is currently located within a ski resort located at Mt. Rose Ski Tahoe. It is imperative to protect existing individuals. The design features included in Section 2.5.3 of the EIS are sufficient to alleviate impacts both directly through avoidance (boardwalk and increased fencing measures) and indirectly through decreases in habitat modification.

The Proposed Action and Alternative 2 have decreased amount of potential disturbance to Tahoe draba due to the absence of the Sky Basin Coaster. Inclusion of the coaster in Alternative 1 would require the building of the boardwalk to allow for access from the top of Tamarack Lift to the top of the Coaster. While the installation of the boardwalk allows for habitat continuity and eliminates direct removal of known individuals, the minor disturbance required for construction remains. Approximately 300' of boardwalk is proposed through the area with existing plants for Alternative 1 (total boardwalk length 645 linear feet). Both the Proposed Action and Alternative 2 will require boardwalk lengths of 345 linear feet through suitable draba habitat). The amount of disturbance required for construction of the boardwalk is minimal, and therefore this impact is considered less than significant.

## **CEQA and TRPA**

**Analysis:** *Less Than Significant Impact; Proposed Project, Alternative 1 and Alternative 2*

The Heavenly Mountain Resort Epic Discovery Project will not result in a trend toward Federal Listing or loss of viability of Tahoe draba (*Draba asterophora* var. *asterophora*). This determination is based on a) the inclusion of the design features that prevent impacts to existing Tahoe draba plants through increased fencing protection measures; b) the installation of boardwalks to prevent the fragmentation of suitable habitat; b) the substantial habitat fragmentation in five occurrences and additional suitable habitat; c) the scope and scale of effects with inclusion of the design features to protect Tahoe draba relative to the total known occurrences on LTBMU and for the species as a whole is minimal and; d) these effects are adequately addressed through the resource protection measures outlined in the 2007 Master Plan Amendment (MPA) Mitigation and Monitoring Plan and design features included in the Proposed Action.

## NEPA

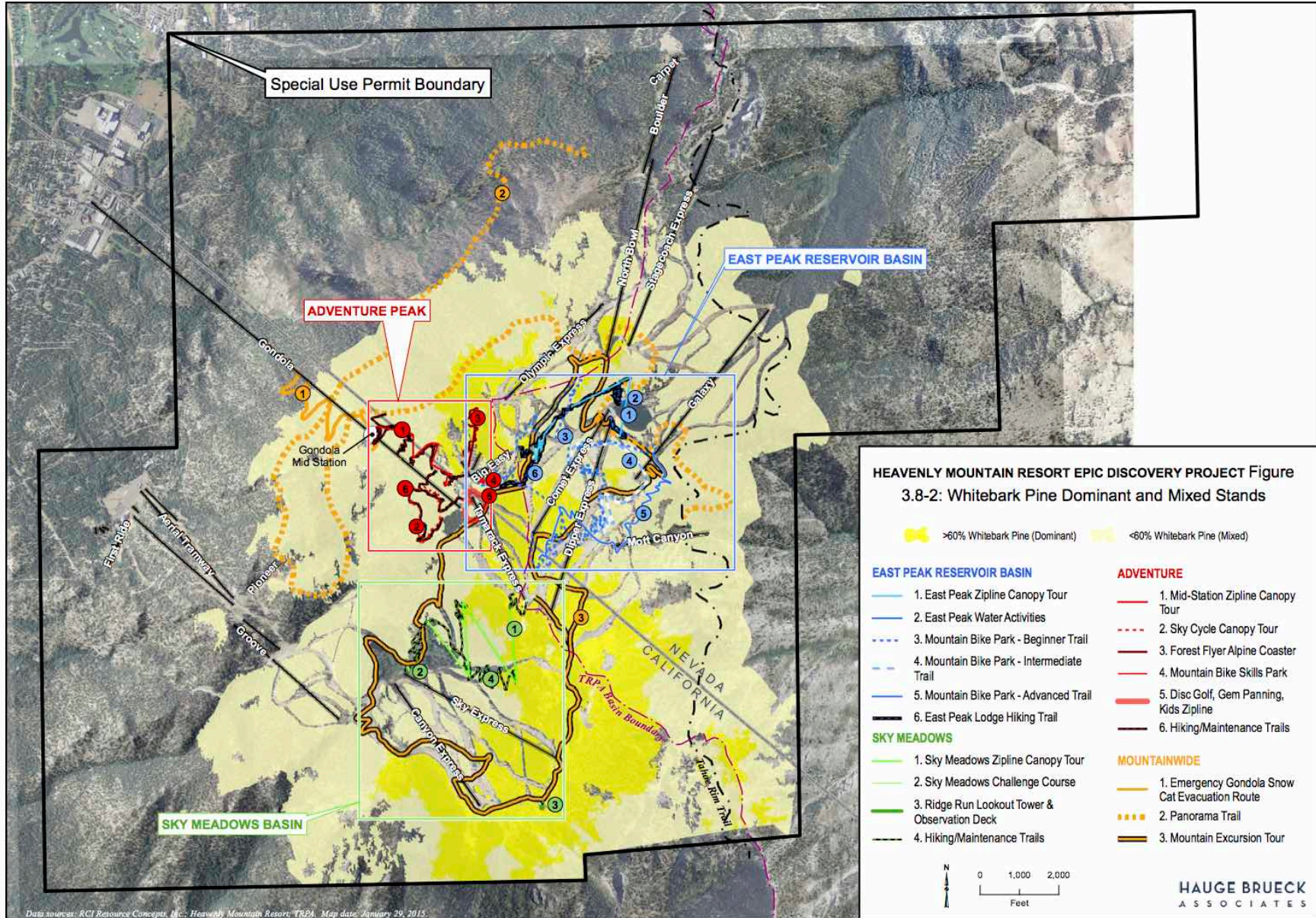
**Analysis:** *No Adverse Effect; Proposed Project, Alternative 1 and Alternative 2*

The Heavenly Mountain Resort Epic Discovery Project may affect individuals, but is not likely to result in a trend toward Federal listing or loss of viability for Tahoe draba (*Draba asterophora* var. *asterophora*). This determination is based on a) the inclusion of the design features that prevent impacts to existing Tahoe draba plants through increased fencing protection measures; b) the installation of boardwalks to prevent the fragmentation of suitable habitat; b) the substantial habitat fragmentation in five occurrences and additional suitable habitat; c) the scope and scale of effects with inclusion of the design features to protect Tahoe draba relative to the total known occurrences on LTBMU and for the species as a whole is minimal and; d) these effects are adequately addressed through the resource protection measures outlined in the 2007 Master Plan Amendment (MPA) Mitigation and Monitoring Plan and design features included in the Proposed Action.

**IMPACT:** **VEG-3: Would the project result in an increase to the risk/threat factors for listing of whitebark pine?**

*Existing conditions:*

Within Heavenly Mountain Resort, whitebark pine exists at higher elevations in mixed stands above 8,000 feet and as pure stands along ridge tops and slopes above 9,200 feet to the top of Monument Peak at 10,100 feet. The distribution of whitebark pine within the Special Use Permit Boundary is currently being determined through mapping and field verification. It should be noted this is a different methodology than was used to estimate the extent of whitebark pine on the LTMBU and therefore estimates may not correlate. EVeg and TEUI layers were utilized together to determine the potential locations of whitebark pine. These potential areas were then re-classified using local knowledge and aerial photography to determine the location of whitebark dominant stands (see Figure 3.8-2). Based on the re-classification/mapping exercise, a total of 910 acres of whitebark dominant stands were identified and 2,827 acres of mixed stands with the potential for whitebark pine to be present. Subsequent to the re-mapping effort a total of 110 plot locations were sampled within the whitebark dominant stands to determine the stand characteristics and the degree of infection from WPBR and mountain pine beetle. The data is currently being entered into FSVeg where it will be analyzed using FVS (Forest Veg Simulator) to generate the desired output. Upon completion of the analysis of the data generated from the 110 plots, the overall health of the stands will be determined, and subsequently a Partnership Action Plan will be completed for the whitebark pine stands located within the Heavenly Special Use Permit Boundary. Through the Whitebark Pine Partnership Action Plan strategies will be developed to manage this species at the resort.



These strategies could include: Long-Term Monitoring, Annual Monitoring, Identifying Plus Trees or those with high cone Output, Seed/Cone Collection, Pruning to limit the spread of whitebark pine blister rust, planting seedlings, creating openings for natural regeneration, and identifying high value stands in order to limit effects from future resort development and to protect them from wildfire.

The USFWS issued a 12-month finding on a petition to list whitebark pine as threatened or endangered with critical habitat in August of 2011. This finding determined the whitebark pine (*Pinus albicaulis*) warrants protection under the Endangered Species Act (ESA), but that adding the species to the Federal List of Endangered and Threatened Wildlife and Plants was precluded by the need to address other listing actions of a higher priority. The finding listed a number of factors that the USFWS determined to be threats to the viability and continued existence of whitebark pine. The threats identified include direct loss from fire (and more importantly fire loss), disease (white pine blister rust and mountain pine beetle) and climate change (USFWS 2011). These threats are discussed below in relation to the species and the potential for the Epic Discovery Project to increase the threat of these factors.

#### *Direct Effects*

Direct impacts to whitebark pine will result due to direct removal of individuals, resulting in a permanent loss of these trees. The following proposed activities include tree removal: Mid-Station Zipline Canopy Tour, Forest Flyer Alpine Coaster, Sky Cycle Canopy Tour, East Peak Zipline Canopy Tour, Sky Meadows Zipline Canopy Tour, Sky Basin Coaster (Alternative 1), and the Gondola Emergency Evacuation Route. Table 3.8-8 lists projects that will result in the loss of whitebark pine. The only projects that are proposed to occur in whitebark dominant stands are the Forest Flyer Alpine Coaster, Sky Meadows Zipline Canopy Tour, and the Sky Basin Coaster (Alternative 1). The remaining projects are located in mixed stands that contain whitebark pine.

#### *Indirect Effects*

#### **Fire and Fire-Suppression:**

Potential impacts to local whitebark pine populations and stands exist from the threat of catastrophic wildfire. A wildfire within Heavenly's Special Use Permit Boundary could impact a large number of whitebark pine. Additionally, over time, fire suppression activities have resulted in the increase in shade tolerant conifer species within whitebark pine stands (USFWS 2011). This change in structure and composition facilitates the increased severity and frequency of wildfire that could result in a stand replacing event and result in the loss of genetic diversity necessary for the species survival in the region.

Implementation of the Epic Discovery projects will result in an increase in human activity in the forested environment at Heavenly Mountain Resort. This increase in human presence in the forest increases the chances for wildfire through accidental or intentional human ignitions. The existing snowmaking system can

be utilized in the event of a wildfire in the area, however many of the proposed activities are located in areas away from existing ski trails and associated snowmaking systems. Heavenly Mountain Resort has a strict management directive that prohibits smoking in their facilities or in outdoor areas (Operations Plan). These measures are expected to reduce the potential for fires from guest activities.

### **Disease:**

By far the largest threat to whitebark pine is from disease in the form of nonnative white pine blister rust. The white pine blister rust (*Cronartium ribicola*) occurs throughout the range of whitebark pine and results in the mortality of infected individuals of all age classes. Typically, white pine blister rust (WPBR) kills cone-bearing branches and seedlings. The existing mortality rate due to WPBR infection is expected to be as high as 57% by 2110 (USFWS 2011). It should be noted a small percentage of whitebark pine are naturally resistant to infection from WPBR and the potential loss of these individuals may result in the genetic material necessary to stave off extreme levels of WPBR infection (AmericanForests.org).

Whitebark pine is also currently being impacted by predation from the mountain pine beetle (*Dendroctonus ponderosae*). The mountain pine beetle attack trees that are often weakened by drought pressures or other infection (WPBR). Upon attacking a tree, the mountain pine beetle mate in the phloem of the tree just under the bark in the living vascular tissue. The females lay their eggs in the phloem which is eaten by the larvae, effectively girdling the host tree resulting in death. The life cycle of beetle is temperature dependent and usually takes between 1 and 2 years.

The combination of impacts from white pine blister rust and mountain pine beetle result in loss to seed cone production. Mountain pine beetle target and kill larger trees which produce the largest number of cones. White pine blister rust often kills cone bearing branches. Together these impacts to seed cone production can decrease the fecundity of the species

Removal of healthy whitebark pine trees from the area could result in a loss of important genetic diversity necessary to promote disease resistance. “Plus trees” are healthy trees that are potentially resistant to infection from the white pine blister rust (*Cronartium ribicola*) ([http://whitebarkfound.org/?page\\_id=1133](http://whitebarkfound.org/?page_id=1133)). They are identified through field surveys by plant pathologists which have not occurred in advance of proposed activities. As such, there is the potential to remove plus trees during the proposed tree removal. If plus trees are removed, their genetic contribution is permanently lost and could reduce the overall stand resistance to white pine blister rust. However, with implementation of project design feature BOT-1 this genetic diversity will not be lost.

### **Climate Change:**

Whitebark pine typically occurs in cold, exposed high-elevation sites. The increase in temperature that is likely to occur as a result of climate change will

result in the decrease in suitability of current habitats for whitebark pine through the loss of soil moisture (Hamman and Wang 2006, Schrag et al. 2007, Aitken et al. 2008). Suitable habitat loss could occur through the overall increase in temperature resulting in the species unable to survive or the increase in competition from other conifer species currently adapted to warmer temperatures. As temperatures increase the area of available habitat decreases at high elevations due to limited space on mountain tops. Increased temperatures also have a positive effect on the mountain pine beetle's life cycle which under warm temperatures can be completed in one year.

The Epic Discovery projects will not result in any significant changes in climate (see Chapter 3.4, Air Quality and Climate Change in the Epic Discovery EIS) and therefore will not increase the climate change risk factor on whitebark pine (HBA 2015).

### **Partnership Action Plan:**

Through the Whitebark Pine Partnership Action Plan strategies will be developed to manage this species at the resort. These strategies could include:

- Long-Term Monitoring – Re-visit whitebark monitoring stands on a five year basis to determine presence/absence of pathogens, overall health of stands and to determine trends in terms of fecundity, survivorship, growth and population growth rate. The Partnership Action Plan will be updated in concurrence with the results of the long term monitoring on a five year basis.
- Annual Data Base Records Update – Update GIS layers, record treatments, incidence of pathogens, project activities, potential threats, natural occurrences/impacts (i.e. wildfire/blow down/stand replacing events). Develop and maintain database that includes spatial and monitoring data in one location.
- Plus Tree/High Cone Output – Identify plus trees and trees with high cone output for future protection and seed collection purposes.
- Seed/Cone Collection – Collect seeds for future planting. Seed to be used for both growing seedlings (in situ and nursery grown) in areas where existing and future regeneration of WBP has been disturbed and genetic diversity has been lost.
- Pruning – implement sanitation pruning on trees that have WPBR cankers on branches within 6” of the stem. The pruning will prolong the life of the existing trees and remove infection before it reaches the main stem, and potentially limit the spread of WPBR to other areas of the study area.
- Regeneration – Creation of openings (thinning) in mixed conifer stands within to allow for natural regeneration through Clarks nutcracker seed dispersal mechanism and reduction of competition from shade tolerant tree species. Active regeneration also may occur through planting collected seeds and/or seedlings grown from nursery sites.

- Wildland Fire Prevention Plan – modify existing fire prevention plan to add increased protection to identified high value WBP stands to prevent mortality of cone bearing trees and maintain genetic variability within the study area.
- Conservation Areas – Identify, delineate and conserve high value WBP stands within the Special Use Permit Boundary while maintaining public recreation and continued development of Heavenly Mountain Resort in accordance with the Master Development Plan (both approved and proposed future projects and ongoing operations and maintenance).

**Table 3.8-8**

**Epic Discovery Projects Resulting in Whitebark Pine Removal**

<b>Project Name</b>	<b>Acres of Mixed Conifer Removal</b>	<b>Acres of Removal within Whitebark Pine Dominant Stands</b>
Mid-Station Zipline Canopy Tour	1.91	0
<b>Project Name</b>	<b>Acres of Mixed Conifer Removal</b>	<b>Acres of Removal within Whitebark Pine Dominant Stands</b>
Forest Flyer Alpine Coaster	0.70	0.70
Sky Cycle Canopy Tour	1.93	0
East Peak Zipline Canopy Tour	1.48	0
Sky Meadows Zipline Canopy Tour	4.12	4.12
Emergency Gondola Evacuation Route	4.70	0
Sky Basin Coaster (Alternative 1)	2.50	2.50
Total Proposed Action	14.84	4.82
Total Alternative 1 (No Forest Flyer)	16.64	6.62
Total Alternative 2 (No Sky Basin Challenge Course)	14.84	4.82

Source: RCI 2014, HBA 2015

As shown in Table 3.8-8, a total of 14.84 acres containing whitebark pine (4.82 acres in whitebark pine dominant stands) will be permanently removed as a result of project implementation under the Proposed Action and Alternative 2. Alternative 1 would include the removal of 16.64 acres of forested habitat containing whitebark pine (6.62 acres of whitebark pine dominant stands). Of the total 910 acres of whitebark pine dominant stands located within the special use permit boundary, the projects listed above in whitebark dominant stands (up to 6.62 acres) will result in a loss of approximately 0.8 percent. The remaining

projects with the potential to remove whitebark pine in mixed stands (2,827 acres) would result in a loss of 10.02 acres (0.3% loss).

Removal of healthy whitebark pine trees from the area could result in a loss of important genetic diversity necessary to promote disease resistance. “Plus trees” are healthy trees that are potentially resistant to infection from the white pine blister rust (*Cronartium ribicola*) ([http://whitebarkfound.org/?page\\_id=1133](http://whitebarkfound.org/?page_id=1133)). They are identified through field surveys by plant pathologists which have not occurred in advance of proposed activities. As such, there is the potential to remove plus trees during the proposed tree removal. If plus trees are removed, their genetic contribution is permanently lost and could reduce the overall stand resistance to white pine blister rust.

Implementation of the Epic Discovery projects will result in an increase in human activity in the forested environment at Heavenly Mountain Resort. This increase in human presence in the forest increases the chances for wildfire through accidental or intentional ignitions. The existing snowmaking system can be utilized in the event of a wildfire in the area, however many of the proposed activities are located in areas away from existing ski trails and associated snowmaking systems. Heavenly Mountain Resort has a strict management directive that prohibits smoking in their facilities or in outdoor areas (Operations Plan). These measures are expected to reduce the potential for fires from guest activities.

The Epic Discovery projects will not result in any significant changes in climate (see Chapter 3.4, Air Quality and Climate Change) as a result of project implementation, and therefore will not contribute to this risk factor for whitebark pine.

## **CEQA and TRPA**

### **Analysis:** *Less Than Significant; Proposed Project and Alternatives*

Direct and indirect impacts to whitebark pine may occur as a result of Epic Discovery Project implementation. The effects are relatively minor (less than 1% acreage removal of both mixed and whitebark pine dominant stands), and the associated potential for the loss of “plus trees” which are resistant to white pine blister rust. The Epic Discovery Projects will not result in the increase in the threat factors to whitebark pine. This impact is considered less than significant. Further, upon completion of the data analysis for the recently completed stand assessments, a Whitebark Pine Conservation Action Plan will be prepared, reviewed and adopted for future use at Heavenly Mountain Resort. The Plan will include necessary measures for the protection of the existing stands and to promote stand health and will be implemented within the Heavenly Mountain Resort Special Use Permit Boundary for future Master Plan development and operations.

## NEPA

### **Analysis:** *Potential Adverse Effects; Proposed Project and Alternatives*

Direct effects to whitebark pine will occur as a result of Epic Discovery Project implementation; indirect effects may occur. These effects are considered less than significant because a) The scale of direct effects is relatively small (14.84 acres in Proposed Action and Alternative 2; 16.64 acres in Alternative 1) compared to the extent of whitebark pine within the analysis area (910 acres of whitebark pine dominant stands and 2,287 acres of whitebark pine in mixed stands) and the Lake Tahoe Basin (less than 1% acreage removal of both mixed and whitebark pine dominant stands); b) the indirect effects are relatively low (e.g. impacts from fire, disease and climate change) ; and c) the proposed activities will not result in the increase in the threat factors to whitebark pine. Cumulatively, these effects may affect individuals, but is not likely to result in a trend toward Federal listing or loss of viability for the whitebark pine.

### **IMPACT:** **VEG-4: Would the project result in a loss of T&E, P&C, FSS, or Nevada at Risk Botanical Species?**

Table 3.8-1 lists the species that are included for evaluation in this document. There are no federally threatened, endangered, or proposed botanical species known to occur or have suitable habitat in the analysis area; as such, none will be affected. Of the species analyzed, only three are known to occur within the Special Use Permit Boundary: *Draba asterophora* var. *asterophora* (Tahoe draba), *Boechea rigidissima* (*Arabis rigidissima* var. *demota*) (Galena Creek rockcress), and *Pinus albicaulis* (whitebark pine).

Impacts to Tahoe draba are discussed in VEG-2 above and impacts to whitebark pine are discussed in VEG-3 above. Galena Creek rockcress is known to occur in only one location (Occurrence ARRID6b) within the Heavenly Mountain Resort Special Use Permit Boundary. Three potential Galena Creek rockcress occurrences have been identified within the Special Use Permit area (ARRID 3, 4, & 5), but these were subsequently dismissed as mis-identifications (CNDDDB 2014). Because this species likely results from the hybridization of other species (Windham and Al-Shehbaz 2007) and its range overlaps several other *Boechea* species (Baldwin 2012), plants that exhibit characteristics inconsistent with the species description have been frequently encountered, making identification challenging and resulting in mid-identifications (C. Rowe pers. comm). The one known occurrence (ARRID6b) is located immediately adjacent to the existing summer roadway that will be utilized by the Mountain Excursion Tour below the Comet Express chairlift. This occurrence was first discovered in 2008; however, subsequent surveys of the area in 2009, 2012 and 2013 have not located any plants. Recent surveys suggest that the plants (2 total) were destroyed during construction activities in 2009 (C. Rowe pers. comm).

Use of the existing summer roadway for construction activities and for the Mountain Excursion Tour will not result in any impacts to the site as the vehicles are required to remain on the existing roadway. Floristic surveys have occurred

for all Epic Discovery Project areas. No additional occurrences of Galena Creek rockcress or other sensitive species (with the exception of Tahoe draba and whitebark pine) were noted.

### **Species Not Known To Occur in Botany analysis area**

While surveys for Forest Service Sensitive and TRPA sensitive and rare plant species have not detected sensitive species other than those noted above, the potential exists for disturbance to rare/sensitive species habitats. Forest Service botanists mapped suitable habitat for sensitive species using GIS analysis (USFS 2014). Based on the GIS analysis, potential habitats are defined for the following rare plant species:

***Boechnera rigidissima* (*Arabis rigidissima* var. *demota*), Galena Creek rock cress:** Within the Botany analysis area, there are approximately 185 acres of potential habitat for Galena Creek rock cress identified within or adjacent to the projects proposed.

***Botrychium* species, moonwort complex:** Within the Botany analysis area, there are approximately 25 acres of potential habitat for moonwort species identified adjacent to the proposed projects. However, the habitat will not be impacted as no projects are located within suitable habitat.

***Bruchia bolanderi*, Bolander's candle moss:** Within the Botany analysis area, there are approximately 25 acres of potential habitat for Bolander's candle moss identified within or adjacent to the proposed projects.

***Dendrocollybia racemosa*, branched collybia:** Potential habitat for branched collybia is located within the Panorama trail project area. Potential habitat is found in mixed conifer old growth stands that have a mineral soil and duff layer and a source of moisture retention (i.e., a stream, or down woody debris).

***Draba asterophora* var. *macrocarpa*, Cup Lake draba:** Within the Botany analysis area, there is potential habitat for Cup Lake draba identified within or adjacent to the proposed projects. This variety is currently known from one element occurrence; therefore, specific habitat preferences are not well defined.

***Draba cruciata*, Mineral King draba:** Within the Botany analysis area, there is potential habitat for Mineral King draba within or adjacent to the proposed projects in the form of rocky slopes and ridges. Protection measures for Tahoe draba habitat as required under existing MPA 07 mitigation measures will protect this species which has not been observed during floristic surveys.

***Erigeron miser*, starved daisy:** Within the Botany analysis area, there is potential habitat for starved daisy where granitic rock outcrops occur.

***Eriogonum umbellatum* var. *torreyanum*, Torrey's or Donner Pass buckwheat:** Within the Botany analysis area, there are approximately 35 acres of potential habitat for Torrey's buckwheat identified within or adjacent to the proposed projects. No observations of this species have been recorded during project surveys.

***Helodium blandowii*, Blandow's bog-moss:** Blandow's bog-moss was not observed during project surveys. For the proposed Epic Discovery Projects, potential habitat can be found in the riparian zones that may be affected within the East Peak Water Activities project area. No observations of this species have been recorded during project surveys.

***Hulsea brevifolia*, short-leaved hulsea:** Within the Botany analysis area, there is potential habitat for short-leaved hulsea where red fir and mixed conifer forests are the dominant vegetation type. The Panorama trail will be located in this habitat type. No observations of this species have been recorded during project surveys.

***Lewisia kelloggii* ssp. *hutchisonii* and *L. kelloggii* ssp. *kelloggii*, Kellogg's lewisia:** Within the Botany analysis area, there is potential habitat for Kellogg's lewisia where there are open ridgetops or flat areas. This species is often found growing in similar habitat to and looks very similar to pussypaws. The top stations for the Sky Basin Coaster (Alternative) and Sky Meadows Zipline will be located in areas suitable for these species. No observations of this species have been recorded during project surveys.

***Peltigera gowardii*, veined water lichen:** Within the Botany analysis area, there are approximately 5 acres of potential habitat for veined water lichen found downstream of projects and could be affected by activities in the upper watershed.

The Proposed Project and Alternatives will result in the removal of forested area and the potential suitable habitat for sensitive plant species. The Proposed Project and Alternative 2 would result in the potential disturbance of 22.46 acres of sensitive plant habitat, while Alternative 1 would result in the disturbance of 25.44 acres.

## **CEQA and TRPA**

**Analysis:** *Less Than Significant; Proposed Project and Alternatives*

There are no known threatened or endangered plant species that occur within the Special Use Permit Boundary. MPA 07 design features and MP 96 mitigation measures are included in the Proposed Action and Alternatives to mitigate impacts to known rare plant species. Most notably, Tahoe draba and Galena Creek rock cress have the potential to be impacted by project activities since these two special status plant species are mapped and/or known to occur within the project area. Inclusion of Design Features (Section 2.5.3) will protect Tahoe draba through installation of Resource Protection Fencing and boardwalks in suitable habitat. Based on the inclusion of these Design Features and the required mitigation measures in the Proposed Action that would require avoidance, this impact is considered to be less than significant.

## NEPA

### **Analysis:** *Potential Adverse Effects; Proposed Project and Alternatives*

Measures included in the Proposed Action and Alternatives 1 and 2 require avoidance of Forest Service Sensitive plant species in the Lake Tahoe Basin. The Proposed Project and Alternatives will result in the removal of forested area and the potential suitable habitat for sensitive plant species. The Proposed Project and Alternative 2 would result in the potential disturbance of 22.46 acres of sensitive plant habitat, while Alternative 1 would result in the disturbance of 25.44 acres.

The Proposed Action and Alternatives may affect sensitive species habitat as noted in the analysis above. However, as none of these species have been observed during project surveys (other than Tahoe Draba, Galena rockcress, and whitebark pine), no individuals will be impacted and implementation of the Proposed Project or Alternatives. The Heavenly Mountain Resort Epic Discovery Project and Alternatives will not affect *Botrychium spp.*, *Dendrocollybia racemosa*, *Draba asterophora* var. *macrocarpa*, *Draba cruciate*, *Erigeron miser*, *Eriogonum umbellatum* var. *torreyanum*, *Helodium blandowii*, *Hulsea brevifolia*, *Lewisia kelloggii* ssp. *Hutchinsonii*, *Lewisia kelloggii* ssp. *Kelloggii*, and *Peltigera gowardii*. This determination is based on the lack of known occurrences and negligible effects to suitable habitat.

### **IMPACT:** **VEG-5: Would the project adversely affect other botanical resources (LTBMU watch list, uncommon plant list communities, SEZs or special aquatic features)?**

#### *LTBMU Watch List Species*

The Lake Tahoe Basin Management Unit (LTBMU) maintains a watch list of plant species that are of conservation concern, but have not been designated as Sensitive by the Regional Forester. This “Watch List” includes species that are newly described; locally rare; range expansions or disjunctive populations; plants of specific public interest; or species with too little information to determine their appropriate status. Table 3.8-9 below outlines the Watch List for LTBMU:

**Table 3.8-9**

**LTBMU Watch List Species**

Scientific Name	Common Name	Habitat Characteristics	Known on LTBMU	Known in Project Area
<i>Boechera rectissima</i> (Arabis <i>rectissima</i> var. <i>simulans</i> )	bristlyleaf rock cress	Dry, sandy, granitic or andesitic soil on mostly gentle slopes of all aspects, in full or filtered sunlight of thinly-littered openings in mature, open Jeffrey pine and white fir; 6,000-7,400 ft.	X	N
<i>Carex davyi</i>	Davy's sedge	Subalpine coniferous forest, Upper montane coniferous forest	X	N
<i>Chaenactis douglasii</i> var. <i>alpina</i>	alpine dusty maidens	Alpine boulder and rock field (granitic)	X	N
<i>Claytonia megarhiza</i>	fell fields claytonia	Alpine boulder and rock field (granitic)	X	N
<i>Cryptantha crymophila</i>	subalpine cryptantha	Subalpine coniferous forest (volcanic, rocky)	Suitable habitat only	N
<i>Epilobium palustre</i>	marsh willowherb	Bogs and fens, Meadows and seeps(mesic)	Known only from herbarium or text records	N
<i>Meesia longiseta</i>	meesia moss	Coniferous forests, stream banks, wet meadows, and fens	X	N
<i>Myurella julacea</i>	myurella moss	Seep like granitic rock walls; on soil over rocks or in crevices in alpine boulder and rock fields; subalpine coniferous forest on damp soil over rocks; 8,800-9,900 ft.	Suitable habitat only	N
<i>Orthotrichum holzingeri</i>	Holzinger's orthotrichum moss	Seasonally wet rocks in small streams of dry montane forests; 1000--2000 m	Suitable habitat only	N
<i>Orthotrichum spjutii</i>	Spjut's orthotrichum moss	Volcanic rock walls; Continually misted, shaded granitic rock faces at high elevations near Sonora Pass.	Suitable habitat only	N
<i>Pohlia tundrae</i>	tundra pohlia moss	Gravelly, damp soils of alpine boulder and rock fields; 8,800-9,900 ft.	Known only from herbarium or text records	N
<i>Sphagnum spp.</i>	sphagnum moss	Wet meadows, bogs, fens; sea-level to subalpine.	X	N
<i>Tomentypnum nitens</i>	tomentypnum moss	Forming lawns and hummocks in calcareous, mesotrophic fens in association with other calciphiles, usually found with hypnaceous moss, such as <i>Paludella squarrosa</i> and <i>Aulacomnium</i> spp.	Suitable habitat only	N

Source: HBA 2014

Botanical surveys for the project area were completed in 2013 and 2014 and did not locate any watch list species. Potential impacts as a result of the Proposed Project and the Alternatives will not occur as none of the watch list species are present within the project area.

### *Uncommon Plant Communities*

Section 3.8-3 outlines the Uncommon Plant Communities that have been identified by the Tahoe Regional Planning Agency. TRPA has applied non-degradation standards to these communities which are as follows: deep-water plants of Lake Tahoe; Grass Lake; Osgood Swamp; Hell Hole; Upper Truckee Marsh; Taylor Creek Marsh; Freel Peak Cushion Plan Community; and Pope Marsh. None of these communities are located within the Botany analysis area. No fens or bogs are located within the Botany analysis area.

### *Stream Environment Zones and Special Aquatic Features*

Three of the Epic Discovery Projects result in new land disturbance and land coverage in mapped Stream Environment Zones (SEZ). The Sky Meadows Challenge Course is located immediately adjacent to Heavenly Valley Creek, but would not include any new disturbance or land coverage within the SEZ boundary. The SEZ in this area is composed of grasses (*Carex nebrascensis*, *Juncus occidentalis* and *Poa preetensis*) and forbs (*Gayophytum diffusum* and *Phacellia hastata*). Construction of the gravel pathway will result in minor removal of vegetation adjacent to the SEZ but will not result in changes to the functioning of the overall habitat structure that exists closer to the stream channel in the form of large willow bushes.

The installation of the Sky Meadows Challenge Course will also result in the removal of limbs from the trees in the SEZ. The change in canopy cover in this area may have an impact on the quality of the SEZ. The removal of tree limbs may result in an increase in water temperature in Heavenly Valley Creek through decreased shading. Past modification to the tree canopy are evident on historical aerial photographs in the area. The condition of the stream in this area shows evidence of being degraded as noted in Chapter 3.1 Water Quality. Increased sun exposure to this portion of the SEZ may compound existing stressors to the health of the SEZ.

The Sky Meadows Zipline access trail crosses (168 sq. ft.) an ephemeral drainage high in the watershed of a tributary of Heavenly Valley Creek. This crossing location is within a mixed conifer stand and does not contain any SEZ habitat features as the ephemeral nature of the channel does not support SEZ vegetation.

The Panorama Trail also crosses a tributary of Heavenly Valley creek in the Maggie's Canyon area (150 sq. ft.). This trail crossing is within a mixed conifer stand and does not contain any SEZ habitat features as the ephemeral nature of the channel does not support SEZ vegetation. It is likely the Panorama Trail will cross other ephemeral drainages lower in the watershed that exhibit similar vegetation and conditions as those discussed above. While these three activities cross mapped SEZ boundaries, no impacts to SEZ habitats will occur as a result of their construction and operation.

The Sky Basin Coaster (Alternative 1) crosses SEZ boundaries located near the Sky Meadows Lodge and access roadway. The base terminal loading and unloading platforms and the lower segments of the coaster alignment cross SEZ

boundaries located between the existing on mountain access roadway and the proposed location for the coaster top terminal (adjacent to the Tamarack Lift top station). Because of its linear nature, the Coaster cannot avoid the mapped SEZs and still unload passengers in the vicinity of the existing mountain access roadway. The SEZ in this location is a mix of grasses and forbs with larger areas of Salix shrubs and aspen scattered throughout the edges of the existing ski trails that currently bisect this area. Since the Sky Basin Coaster can be constructed above the ground with only minimal disturbance required for the coaster footings, vegetation removal will be minimal. The footings required for the coaster will result in minor removal of riparian vegetation, but will not result in changes to soil compaction, hydrology or otherwise result in an adverse effect on the functioning of the SEZ habitat.

No species aquatic features are located within the study area.

### **CEQA and TRPA**

**Analysis:** *Less Than Significant; Proposed Project and Alternatives*

The Epic Discovery Project and Alternatives will not result in any impacts to uncommon plant communities as none of the listed communities or fens and bogs occur within, or adjacent to, the project area. The Epic Discovery Project and Alternatives will result in the loss of riparian vegetation in SEZs, however this loss is minor and will not result in the loss of functioning SEZ habitat, therefore this impact is considered to be less than significant.

### **NEPA**

**Analysis:** *No Adverse Effects; Proposed Project and Alternatives*

The Epic Discovery Project and Alternatives will not result in any adverse effects to other botanical resources (i.e. LTBMU Watch list species, special aquatic features such as fens and bogs) because there are no known Watch List species occurrences or fens and bogs located within, or adjacent to, the project area.

**IMPACT:** **VEG-6: Will the Project result in the removal of any native live trees larger than 24-inch dbh, and late seral habitat as defined by TRPA or SNFPA?**

The proposed Epic Discovery Projects and Alternative will result in the removal of 24" trees. In order to estimate the number of trees 24" and larger that are proposed for removal, stand data collected for the 2007 Master Plan Amendment EIR/EIS/EIS was utilized. The stands were surveyed in 2006 for project areas where Epic Discovery projects will be located. These stand characteristics remain valid to determine the number of trees in each stand area and the ratio of trees larger than 24" dbh and the number of trees less than 24" dbh. Using this data, the acreage of tree removal required for each project is utilized to calculate the estimated number of trees required for removal and the percentage of trees likely to be 24" dbh and larger. A total of five stands were identified for sampling and the results are outlined in Table 3.8-10. Please refer to Vegetation Impact VEG-3

in the 2007 EIR/EIS/EIS for a description of the methods utilized for the stand analysis.

A total of seven Epic Discovery Projects will require measurable tree removal. Table 3.8-11 identifies the acres of clearing required for each project and the number of trees larger than 24" that are likely to be removed based on the number of 24" or larger trees/acre identified in Table 3.8-10.

**Table 3.8-10**

**Number of 24" or Larger Trees/Acre by Stand**

<b>Stand Name</b>	<b>Number of 24" or larger trees/acre</b>
Upper California Stand	13.6/acre
Lower California Stand	8.2/acre
Von Schmidt Flat Stand	9.8/acre
Upper Nevada Stand	9.1/acre
Lower Nevada Stand	14.8/acre

Source: HBA 2014

In order for the trees to be removed in the Lake Tahoe Basin, findings must be made by the TRPA. Two TRPA Code sections (61.1.4 and 61.1.7) address removal of trees at ski areas. Each of the code sections is printed below followed by a discussion of whether the necessary finding can be made.

61.1.4 Standards for Conservation and Recreation Lands or SEZs: Within lands classified by TRPA as conservation or recreation land use or SEZs, any live, dead, or dying tree larger than 30 inches diameter at breast height (dbh) in west side forest types shall not be cut, and any live, dead or dying tree larger than 24 inches diameter at breast height in eastside forest types shall not be cut, except as provided below.

- (6) In ski areas with existing TRPA-approved master plans, trees larger than 30 inches dbh in the westside forest types and 24 inches dbh in eastside forest types may be removed for facilities that are consistent with that master plan. For activities that are consistent with a TRPA-approved master plan, trees larger than 30 inches dbh in the westside forest types and 24 inches dbh in eastside forest types may be removed when it is demonstrated that the removal is necessary for the activity.

**Table 3.8-11**

**Estimated 24" or Larger Tree Removal By Project**

<b>Project Name</b>	<b>Acres of Tree Clearing Required</b>	<b>Stand Location</b>	<b>Number of 24" or larger trees/acre</b>	<b>Estimated # of 24" or larger trees to be removed</b>
Mid-Station Canopy Tour	1.91	Von Schmidt	9.8/acre	19
Forest Flyer	0.70	Von Schmidt	9.8/acre	7
Sky Cycle Canopy Tour	1.93	Von Schmidt	9.8/acre	19
East Peak Canopy Tour	1.48	Upper Nevada	9.1/acre	13
Sky Meadows Canopy Tour	4.12	Upper California	13.6/acre	57
Emergency Gondola Snowcat Evacuation Route	4.7	Von Schmidt	9.8/acre	46
Sky Basin Coaster (Alternative 1)	2.50	Upper California	13.6/acre	34
<b>Total Proposed Action</b>	<b>14.84</b>	--	--	<b>161</b>
<b>Total Alternative 1 (No Forest Flyer)</b>	<b>16.64</b>	--	--	<b>188</b>
<b>Total Alternative 2 (No Sky Basin Coaster or Ropes Course)</b>	<b>14.84</b>	--	--	<b>161</b>

Source: RCI 2014 and HBA 2014

Tree removal for the Epic Discovery project is required in order to operate the proposed activities (e.g., ziplines, canopy tours, sky cycle and coasters require tree removal for facility construction or user safety). The design feature included in the 2007 EIR/EIS/EIS to restore a 41 acre stand in High Meadows to advance late seral old growth characteristics has been implemented by Heavenly and will also offset effects of removal of large trees over 24 inches in diameter for the proposed Epic Discovery Project. The 41 acres treated in High Meadows was larger than was required for mitigation of impacts identified in the 2007 EIR/EIS/EIS (19.32 acres) and is sufficient to offset impacts resulting from removal of approximately 161 trees (Proposed Action and Alternative 2) and 188 trees (Alternative 1) larger than 24" dbh. The removal of 14.84 acres of large trees under the Proposed Action and Alternative 2 and the removal of 16.64 acres under Alternative 1 is offset by the enhancement of the 41 acre stand in High Meadows.

61.1.7 Reasons For Tree Removal: Except for trees identified for retention under subsection 61.1.4, tree removal shall incorporate measures and prescriptions that promote a range of threshold standards and SEZs pursuant

to subparagraph 61.1.6.C. Trees may be removed for the reasons provided below.

H. Tree Removal For Ski Areas And Rights-Of-Way: The following tree removal standards apply to ski areas and utility and public rights-of-way:

(1) For expansion of ski areas, including but not limited to, the widening of runs and the addition or replacement of lifts, only the minimum number of trees necessary for the operation of the ski area shall be removed.

The Epic Discovery projects that require the removal of large trees include coasters, canopy tours, evacuation routes and structures associated with these activities. Each activity would remove the minimum number of large trees required to implement the project. The purpose and need for the Epic Discovery activities is provided in Chapter 1.3 of this EIR/EIS/EIS. The proposed facilities, by their very nature are proposed in a forested location that requires tree removal and cleared areas for safety. The evacuation route also requires trees to be removed to allow for emergency snow cat access during over the snow winter operations.

No Epic Discovery projects will result in the removal of late seral old growth forest habitat. As documented in the analysis in Chapter 3.8 (Figure 3.8-1) of the 2007 EIR/EIS/EIS, late seral forest exists within the Special Use Permit boundary, but none of the Epic Discovery projects or Alternatives require tree removal within mapped late seral forest.

## **CEQA and TRPA**

**Analysis:** *Less Than Significant; Proposed Project and Alternatives*

No impacts to late seral/old growth forest would result from implementation of the Proposed Action or Alternatives. A maximum of 188 (Proposed Action and Alternative 2 - 161, Alternative 1 - 188) 24" dbh trees or larger have the potential to be removed. As the above findings have been made for tree removal in a Ski Area, and the facilities require the removal of large trees based on their linear nature or to meet safety requirements, this impact is considered to be less than significant.

## **NEPA**

**Analysis:** *No Adverse Effect; Proposed Project and Alternatives*

No late seral old growth forest will be removed as a result of the Proposed Project or Alternatives. No adverse effects would result as the Record of Decision for the Sierra Nevada Forest Plan Amendment dictates that vegetation management standards and guidelines do not apply to recreation special use projects such as Ski Area Master Plans. Therefore, no adverse effects would occur as a result of the implementation of the Proposed Project or Alternatives.

**IMPACT: VEG-C1: Will the project have significant cumulative impacts to vegetation?**

The following analysis evaluates cumulative effects from past, present, and future project on the sensitive species analyzed (Table 3.8-1) from future Heavenly Mountain Resort Master Plan winter development. Past management and construction activities at Heavenly Mountain Resort has modified the vegetated environment since the resorts inception in the 1950s. Large areas of ski trails have been cut into the forested area s well as large areas graded in the past for creation of these trails. This has modified and fragmented the habitat. Quantitative estimations are more accurate for known occurrences than suitable habitat because the best available data for suitable habitat are only rough estimates (see Veg-3); For effects to suitable habitat it is assumed that habitats that intersect proposed activities may be adversely affected, reducing the potential for a species to expand. The additional disturbance of 25.44 acres of forested area, including whitebark pine for Alternative 1 and 22.46 acres for the Proposed Project and Alternative 2 together with the overall loss of forested area from past actions is relatively small. As stated above, impacts to Tahoe draba and Galena Creek rockcress have been limited as a result of the Proposed Project and alternatives, and as such, no cumulative effect to these species will occur. The inclusion of the Partnership Action Plan that is being developed to protect whitebark pine within Heavenly Mountain Resort in light of the existing and proposed developments, will limit negative cumulative impact to whitebark pine. The types of projects implemented within the Lake Tahoe Basin that may result in cumulative effects to suitable habitats and general forest types include (HBA 2007):

- Fuels treatment projects may have direct and indirect impacts if a sensitive species is present; however, projects are not expected to alter the habitat to the degree that it can no longer support the species. Therefore, while fuels treatment projects may have immediate short-term impacts, they generally do not cause permanent loss of habitat. Fuels treatments (i.e. South Shore Fuels Reduction Project and Kingsbury Fuels Reduction Project) modify existing general forest types, but do not contribute to an overall loss or removal. Instead, these fuel treatments provide for better protection of general forest by reducing the chances of catastrophic wildfire.
- Restoration projects as have occurred in Edgewood Creek Drainage are designed to improve ecosystem function and habitat sustainability. While there may be negative short term direct effects, long term effects are hypothesized to be beneficial for sensitive species and therefore restoration projects generally do not result in negative cumulative effects. Restoration projects provide for enhancement of general vegetation types (i.e. riparian areas and general forest) and increase the overall acreage of these vegetation types.
- Ski lift construction and upgrade projects may cause immediate disturbance, fragmentation and permanent loss of sensitive species' habitats. There is potential for direct and indirect impacts to occur to

individuals that may be present in project footprints. Once ski lifts are installed, suitable habitats often do not recover due to continued maintenance and modification of overstory canopy cover resulting in changes in microhabitat. Suitable habitat for rare plants often does not recover, as is the case with Tahoe draba (Putnam 2013). Ski lift construction results in a permanent loss of general forest types through direct removal. These projects contribute to the overall loss of forested areas and sensitive species habitats within Heavenly's operating area.

- Trail construction and upgrades (some with snowmaking installation) may cause permanent loss of habitat, due to the constant maintenance of the trails. Trails that are gladed instead of traditionally cleared reduce the amount of habitat loss; however, for this analysis, the assumption is that all trails would be traditionally cleared.
- Lodge construction and expansion may cause permanent sensitive habitat and general forest loss due to the installation of a permanent structure.
- Snowmaking projects may have direct effects to sensitive species if the equipment and pipelines are installed where plants are located. In addition, the increase in snow depths could indirectly affect species' reproductive success. However, most of these projects are located on existing trails where the majority of habitat for sensitive species has already been lost.

Potential effects to sensitive plant species may occur as a result of future projects, through the removal of suitable habitat and the potential for direct removal of plants. The exact extent of the potential effects cannot be determined due to a lack of site specific surveys for future Heavenly and non-Heavenly projects. A list of future projects that have been through the NEPA process but have not been implemented and also those projects included in the MPA 07 but have not received NEPA analysis are included in Appendix A of the Epic Discovery Biological Assessment and Biological Evaluation.

While it is likely that future effects may occur from future Heavenly operations and implementation of future Heavenly projects, these effects would be avoided due to compliance with existing standards and regulations, avoidance measures to be implemented with the development of each project, or habitat mitigation plans developed as part of future environmental documentation. As required by the LMRP, projects on National Forest system lands must ensure that activities do not result in a loss of species viability.

Additionally, the 2007 MPA mitigation monitoring plan includes the following measures to prevent the loss of special status plant species and their habitats in the future:

- 7.4-15 Minimize Removal/Modification of Deciduous Trees, Wetlands, and Meadows;

- 7.5-21 Protect Tahoe Draba Populations within Heavenly Mountain Resort;
- 7.5-23: Minimize Loss/Degradation of Sensitive Plant Species; and
- 7.5-24 Invasive Plant Management.

## **CEQA and TRPA**

**Analysis:** *Less than Significant; All Action Alternatives*

Potential impacts to sensitive plant species may occur as a result of future projects, through the removal or degradation of habitat and the potential for direct removal of plants. The exact extent of the potential impacts cannot be determined due to a lack of site specific surveys for future Heavenly and non-Heavenly projects. While it is likely that future effects may occur from future Heavenly operations and implementation of future Heavenly winter Master Plan projects, these effects would be reduced due to compliance with existing standards and regulations, avoidance measures to be implemented with the development of each project, or habitat mitigation plans developed as part of future environmental documentation. Therefore, this potential cumulative effect is considered less than significant. Additionally, the mitigation monitoring plan includes the following measures to prevent the loss of special status plant species and their habitats in the future: 7.4-15 Minimize Removal/Modification of Deciduous Trees, Wetlands, and Meadows; 7.5-21 Protect Tahoe Draba Populations within Heavenly Mountain Resort; 7.5-23: Minimize Loss/Degradation of Sensitive Plant Species; and 7.5-24 Invasive Plant Management.

## **NEPA**

**Analysis:** *No Adverse Effects; All Action Alternatives*

When analyzed in the context of past, present, and future projects, the project will not contribute cumulatively to a loss of species viability for *Boechnera rigidissima* (due to known occurrences not being impacted as a result of project activities) and *Draba asterophora* var. *asterophora*. This determination is based on a) the inclusion of the design features that prevent impacts to existing Tahoe draba plants through increased fencing protection measures; b) the installation of boardwalks to prevent the fragmentation of suitable habitat; b) the substantial habitat fragmentation in five occurrences and additional suitable habitat; c) the scope and scale of effects with inclusion of the design features to protect Tahoe draba relative to the total known occurrences on LTBMU and for the species as a whole is minimal and; d) these effects are adequately addressed through the resource protection measures outlined in the 2007 Master Plan Amendment (MPA) Mitigation and Monitoring Plan and design features included in the Proposed Action.

Heavenly Mountain Resort Epic Discovery Project and Alternatives (1 and 2) may affect individuals, but is not likely to accelerate the trend toward Federal listing or result in loss of viability for whitebark pine (*Pinus albicaulis*).

When analyzed in the context of past, present, and future projects, the Heavenly Mountain Resort Epic Discovery Project and Alternatives (1 and 2) will not affect *Botrychium* spp., *Dendrocollybia racemosa*, *Draba asterophora* var. *macrocarpa*, *Draba cruciate*, *Erigeron miser*, *Eriogonum umbellatum* var. *torreyanum*, *Helodium blandowii*, *Hulsea brevifolia*, *Lewisia kelloggii* ssp. *Hutchinsonii*, *Lewisia kelloggii* ssp. *Kelloggii*, and *Peltigera gowardii*. This determination is based on the lack of known occurrences and negligible effects to suitable habitat.